POPULAR Computing WEEKLY

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Vol 4 No 30

C128 'price is right' – extras still unclear

COMMODORE has finally announced the UK price for its new C128 micro – £269

The announcement was made as the micro was launched to the British trade last Thursday, July 18

Prices for the C128's disc unit and monitor packages are, however, still being kept secret.

The first machines are scheduled to be in the shops by September, but a Commodore source suggested the first machines will arrive in late August

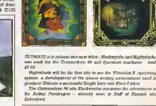
Commodore is claiming that the new machine is effectively three micros in one, – a Commodore 64, a 128K machine and a CP/M machine

In 64K mode, the C128 emulates a Commodore 64 exactly It has a 6502-compatible microprocessor, the 6502, a 40 column by 25 line display and runs Commodore Basic 2 0 It has 64K Ram, 16K Rom, and graphics allow 16 colours and eight sprites

In 128K mode, the machine's Ram goes up to 128K, although only 118 5K is available to the user 72K of Rom supports the C64 and C128 operating systems and the character generation Basic is new – version 7 0 – and there is a built-in machine-code monitor Display capabilities are either 40 by 25 lines, or 80 by 25 lines

In CP/M mode the machine's on-board Z80A sec-

continued on page 4



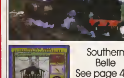




ULTIMATE is to release two new titles – Blackwyche and Nightshade, one each for the Commodore 64 and Spectrum machines – both £9 95

Nightshade will be the first title to use the 'Filmation II' operating system a development of the games writing environment used to produce Ultimate's successful Knight Lore and Alien 8 titles

The Commodore 64 title Blackwyche continues the adventures of Sir Arthur Pendragon – already seen in Staff of Karnath and Entombed.



Southern Belle See page 43 New Releases

Acorn MD

ACORN Computers has apparently appointed a new managing director, taking over from Alex Umboldi, Olivetti's trouble shooter.

He is Brian Long, an American, who leaves the Canadian tractor firm Massey Ferguson to join the troubled Cambridge micro company

An Acorn spokesman declined to comment on the appointment.

NEW!!

RED MOON MoonQuest fantasy adventure for most micros. The Moon Crystal of Xa supplied good magik for the honest rulers of the kingdom of Baskalos. Then it was stolen and the land fell into chaos. You must recover the Moon Crystal from the magik-rich castle where it is hidden, armed only with your wits and spells.

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BBC (Acornsoft dfs)/CBM64 disk versions are now available for those games marked * at £11.95 new or £2.50 upgrade (please return your original cassette).
† Text adventure on all 8 micros. ‡ Selected versions have pictures in addition to text.

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EDITORIAL

Just who is going to buy Commodore's new C128? On the one hand Commodore seems to be pushing the machine as the natural successor to the Commodore 64. On the other, the company is anxious to dispel concern among its distributors that the machine may take sales from the C64.

The basic console alone – at £260 – is nothing more than a very expensive way of buying a Commodore 64. To use the micro to the full in C128 mode – and resolve the mode's 80-column display – you need to buy either of Commodore's two monitor units. No price has been announced for the monitors, but the cheapest is likely to cost around £150. To use the micro in CP/M mode and be able to use the range of often expensive disc software available under the CP/M operating system you need Commodore's 1571 disc unit – maybe another £150. Do you want the mouse as well? That could cost perhaps another £75. All in all you could spend nearly £700 to make the most of your C128.

Depending on your viewpoint, the C128 is either a £260 micro that can grow with you as your expectations increase. Or it is a £260 micro which only operates at a third of its potential.

I am inclined to think that manufacturers like Commodore, Atari, Sinclair and now even Amstrad are misjudging what people want. There doesn't seem much doubt that any 'quantum leap' in home software (predominately entertainment programs) means fast complex graphics animation. That in turn means 16-bit (unlike the C128) with lots of memory. But it doesn't necessarily have to mean discs and monitors.

A £199 stripped-down 256K 68000 machine, determinedly running cassette-based software linked to an ordinary cassette player and configured to work with an ordinary colour TV, would probably do well.

The Spectrum was always bound to out-sell in units the Commodore 64, and the Commodore 64 the BBC. Simply because of price.

The same philosophy will hold true for the new generation of home micros. It is a mistake for manufacturers to make expensive features like discs and monitors essential. Instead, they should be optional extras.

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ABC

56 062 copies sold every week (Jan June 1984 ABC)

Popular Computing Weekly. Tel. 01-437 4343.

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Computer Trade Association Magazine of the Year

Schools go for CPCs

AMSTRAD's attack on the Acorn-dominated schools micro market is achieving some success with sales so far to more than 15 local education authorities.

Northern Computers, a Warrington-based company which was appointed sole educational distributors by Amstrad some nine months ago is selling machines at a discount to schools and educational authorities throughout the UK.

The disc based Amstrad CPC 664 with green screen monitor sells to educational authorities at £279, and the colour monitor version sells for £369. In addition, Northern Computers is bundling £200 of educational software with each machine.

According to Northern Computers director Gareth Littler, "Amstrad appointed us sole educational distributors, and we set up the Amstrad Educational Scheme, which has been gathering momentum ever since."

Schools have been buying both the 464 and the 664 but Gareth Littler said, "The 664 overtook the 464 almost immediately it was made available to educational authorities."

Northern Computers has also designed a ring network system which can handle up to 122 micros per ring. It can be used to link Amstrad 464s, 664, BBC Bs, Apricots, Apples and IBM PCs.

The first network to be installed by Northern Computers will be at the Bootle High School, which comes under the Sefton Educational Authority. The planned network will include 18 Amstrad 464s.

The network interface includes a built-in Z80 microprocessor, and sells for £125 per computer to educational authorities.

According to Louis Melia, the man in charge of the Amstrad sales office at Northern Computers, the peak period for sales to educational authorities is March, when all the cash remaining in the year's education budget must be spent or lost.

"We were moving between six and 12 Amstrads a day last March. This year we are aiming at 100 per day in the Christmas period and next March."

He suggest that one reason some schools were turning to Amstrad was that "they are having difficulty getting new BBC Bs."

In addition to the network and associated products, Northern Computers has also produced an implementation of BBC Basic which runs on the Amstrad machines, which has increased the machines' appeal to schools.

C128 launch

continued from page 1

ond microprocessor allows the user to run a wide variety of business software.

To fully utilise the extra features of the new machine, however, purchasers will also have to buy a monitor and the new 1571 disc drive.

While the C128 has RGB, RF, and video outputs without a monitor, users cannot display 80 columns. Commodore recommends either its 1900-C colour monitor, or 1900-M monochrome monitor.

While the C128 will work with the existing 1541 disc drive perfectly well in 64K mode, Commodore is recommending the new 1571 disc drive to C128 purchasers. The 1571 will apparently emulate the 1541 when the micro is in C64 mode, but in 128K mode it works faster.

In CP/M mode, the 1571 disc drive can read discs formatted for other, non-Commodore, business machines, including those produced by IBM Kaypro and Osborne.

Commodore was not revealing prices on the 1900-C and 1900-M monitors mouse or 1571 disc drive at the launch. Dealers were being informed that the uncertainty of the rate of exchange between dollar and pound was to blame for this, although the same uncertainty did not affect Commodore naming a price for the micro itself.

1900-M monochrome monitor

Some indication of UK prices to come can be seen in the US prices. In the US the C128 sells for $349.95, (about £289), the 1571 disc unit is $299.95 (about £230) and the mouse is $49.95 (about £38).

1900-C colour monitor

Most of the dealers present at the launch of the C128 seemed to feel that £289 was a very competitive price, even though the prices of the monitors and the disc drive were not available.

1571 disc drive

Ray Kulag, managing director of Compustore, one of London's leading Commodore dealers, said simply "The idea is right, and the price is right."

Buyers for the big chains, such as W H Smith, John Menzies, Boots and Laskys, were unwilling to commit themselves, however.

A Laskys' spokesman said "I would imagine that we probably will be taking it – but we have until September to decide."

Both John Menzies and WH Smith are still in negotiations with the major computer manufacturers – until those discussions are concluded no decisions will be made.

1350 mouse controller

Compunet slings MUD at BT

COMPUNET, the Commodore dedicated networking system, is to open up its version of Multi User Dungeon to non-Commodore 64 owners in August, bringing it into direct competition with British Telecom's MUD system to be launched a month later in September.

According to Compunet's Alan Carmichael, to play Mud on Compunet, the user's micro is effectively phased out of the Compunet system and becomes a 'dumb terminal' for the host main-frame. In future, owners of any micro with a modem operating at 1200/75 baud rate, and terminal emulation software (usually included in the programs needed to run a modem) will be able to by-pass the main Compunet system and enter MUD direct.

Compunet is also introducing new charges for MUD. Players will pay a certain amount per month, and then an hourly rate which varies according to the monthly payment opted for – if the subscription charge is fixed at £5 per month, the player will pay £2.50 per hour, but choose to pay £25 per month, and the hourly rate drops to £1.75.

"The hourly rate includes all network charges – and because Compunet already has access points across the UK, the phone bills are cheaper too," said Alan Carmichael.

■ British Telecom's competing enhanced version of MUD, will be open to users with modems which operate at both 1200/75 and 300/300 baud rates (see *Popular Computing Weekly*, July 18).

Beyond the pond

BEYOND has licensed three of its games to Mindscapes, the American software house

The three games involved are *Lords of Midnight*, *Shadowfire*, and *Quake -1* the last of which has yet to be released in the UK

The Beyond brand label will be given equal prominence to the Mindscapes logo Clive Bailey, Beyond's marketing manager, claims that Beyond is "the first company to licence a UK game to the States on its own terms, preserving its own brand name"

FAST action

THE COPYRIGHT (Computer Software) Amendment Bill completed its final stage in Parliament on July 5, and received Royal Assent – the final stage making the bill law – on July 16

The so-called FAST Bill, named after the industry lobby group Federation Against Software Theft extends copyright protection to all computer software, thus ending the loophole in the law which effectively allowed pirates to get away with stealing programs

Under the revised 1957 Copyright Act anyone guilty of breaching copyright on computer software – through unauthorised manufacture, translation or sale – can be fined up to a maximum of £2,000 per offence and imprisoned for up to two years. The new penalties come into force in mid-September

Previously, the only legal actions that have succeeded against piracy revolved around documentation or music both of which are copyright protected.

As the bill became law the Federation Against Software Theft announced it has appointed an Enforcement Co-ordinator – former Chief Superintendent Bob Hay – to act as a focal point for copyright enforcement activities in the software industry Bob Hay – who retired from the Metropolitan Police force in June this year - commented, "It is FAST's objective to ensure that companies and enforcement agents are not working in isolation. We are already working to build up a database of facts to facilitate complete cross checking"

Sinclair deal is still on

SINCLAIR Research has scotched press speculation that the rescue deal between a Maxwell subsidiary, Hollis, and the ailing micro manufacturer is in trouble

"The takeover should be completed by September," said a spokesman "But when one of the companies involved in any such deal is listed on the stock exchange, as Hollis is, there are strict rules of practice that must be followed, and these take time," he continued

Activision

ACTIVISION has now appointed its new UK managing director to fill the gap left by Geoffrey Heath's departure to Melbourne House

The new chief will be Hugh Rees Parnall, 36 years old, and sales and marketing manager at RCA/Columbia Pictures Video UK prior to the Activision post

Growing up

I agree with much of Brian Walthams letter (July 11 issue) but I don't think the present way the computer industry is 'growing' can be described as 'up', nor is it particularly healthy

The industry is undoubtedly contracting and in so doing, unfortunately it seems to be the manufacturer with the biggest and best games machine or the software house with the newest arcade games program that seems to be surviving

I say unfortunately, because I have never seen what all the fuss involving computer games is about. Surely computer games and for that matter those who play them, bear little relevance to computing (home or otherwise) and have a closer affinity to those who enjoy *Snakes and Ladders*, *Ludo*, *Mousetrap*, or any one of a number of similar board games The additional 'sophistication' brought about by playing games on a computer rather than a playing board, is a benefit of the medium on which the game is played and the skill of the programmer, nothing else

There is nothing clever about punching a few keys or manipulating a joystick to play a game, it contributes nothing to the computing knowledge of the player Those who seek to justify the fact that they still indulge themselves in the childish activity of playing games, by calling it 'home computing' are fooling nobody but themselves

It can be argued that but for the massive games market, the cheap home computer would not exist. But, equally, the present contraction in the market is due to many of those former games players growing out of their toys, as they did with CB radios, and moving on to something else

One can only hope that some of these, instead of growing out of their toys, grow up with them and realise that there is a lot more to computing than zapping aliens, camels, ghosts and rampaging toilet seats

H G Jones
14 Ambercourt Close
Abergavenny,
Gwent NP7 9TY

Micronet competition

This is the fourth and final clue in the competition to win free 30 memberships of Micronet and Prestel held in conjunction with Thames TV's *Database* programme and Microcast 800

When, using the solution to this last puzzle, in conjunction with the previous puzzle answers, you think you have found the overall solution to the competition, you should send it to the address below Closing date is Friday 16th August 1985

Entries to: Micronet Viscode Crossword Competition, Durrant House, 8 Herbal House, London EC1R 5EJ

Final Clue

Part A

"The Cobb has invited what familiarity breeds far at least seven hundred years, and the real Lymers will never see much more to it than a long claw of old grey wall that flexes itself against the sea In fact since it lies well apart from the main town, a tiny Piraeus to a microscopic Athens they seem almost to turn their backs on it. Certainly it has cost them enough in repairs through the century to justify a certain resentment. But to a less tax paying, or more discriminating eye it is quite simply the most beautiful sea-rampart on the south coast of England. And not only because it is, as the guide books say, redolent of seven hundred years of English history because ships sailed to meet the Armada from it, because Monmouth landed beside it but finally because it is a superb fragment of folk art.

Primitive yet complex, elephantine but delicate as full of subtle curves and volumes as Henry Moore or Michelangelo, and pure, clean salt, a paragon of mass I exaggerate? Perhaps but I can be put to the test, for the Cobb has changed very little since the year of which I write "

Part B

"At the Great Norman Abbey circa 305,
The first Christian martyr, and namesake, died,
Running through the town is the River Ver
Past the excavated ruins on view there.

My Answer: ....

Name: ....

Address: ....

Computer owned: ....

Revised version

A small fault has recently been brought to my attention in my Amstrad program *Statement of Account* giving a subscript error report. It is caused when collapsing the arrays dealing with Standing orders and Special expenditure sections If lines 11250 and 14580 are replaced with the lines below and the program is re-saved there should be no further problems

```
11250 FOR k=0 TO 1 a$(pa,k)="" a(pa,k)=0
NEXT q$="O"
14580 FOR n=x TO ct ct$(n)=ct$(n+1)
spend(n)=spend(n+1)
NEXT ct$(ct)=""
spend(ct)= ct=ct-1 GOTO 14060
```

Readers who sent for the program on cassette have either been contracted or have been sent revised versions

D G Shedden
Lomond
The Green
Belchamp St Paul
Sudbury
Suffolk

Super computer?

Popular Computer Weekly's news section has recently been describing the Atari ST as a super computer that's very much better than the QL.

I do not believe this to be the case The difference in external buses of the microprocessors only increases speed by 30% and when you consider that the ST's operating system is written in a compiled high-level language and that the Rom is accessed two bits at a time, it looks as if the ST could actually be slower than the QL

Also the original 192K of internal Rom has been reduced to 16K This presumably means that 176K of language and operating system must now be loaded into the machine for disc before use

The machine lacks the structured basic of the QL and to some extent the BBC computer, although the other languages provided may compensate for this

All of this taken together with the complete lack of software makes the Atari ST compare unfavourably with an equivalent QL system

Barry Adams
77 Twyford Abbey Road
London NW10

Biased comments

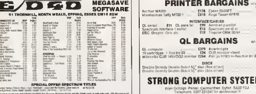
I have just read your editorial in the July 4 issue, and I must protest about your final comments

I refer to the comment "to begin with, the top Spectrum software will knock spots off its ST rivals"

The top Spectrum software can't knock spots off the Atari 8-bit software, let alone the insult of comparing the Spectrum to the ST It's like comparing a beat-up old Mini with a brand new Rolls You couldn't even truthfully make a comparison between the sawn-off QL and the ST

You are so biased towards the Spectrum, I'm surprised you don't call the magazine *Spectrum Computing Weekly*

Ken Ward
Norwich Users Group
Lakenham
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Round one

Program *Rocco* **Price** £7 95 **Micro** Spectrum 48K **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS

Far be it from me to suggest that boxers are all bone-headed, bludgeoning, body-crunchers after all, they're bigger than I am! However I have no hesitation in stating that the average computer user is unlikely to go three rounds with my kid sister let alone the Boston Bruiser.

Until now the only way out was via Charles Atlas, but at last here's an alternative, the opportunity to beat your opponents to a bloody pulp in the privacy of your own home No weight training, no unpleasant exercise and you can retain that much sought after physique of a seven stone weakling

As *Rocco* you take on a series of increasingly heavy and brutal pugilists Your view is from just above your boxer's head and the large animated figures are excellent, as is the cheering crowd in the background. There are only four controls – attack/defend, left/right – but nobody ever suggested that boxing was intellectually challenging

Well, I went a few rounds pulverising early opponents until somebody gave me the old one-two and I went out like a light. But something was missing I know my trainer told me to stand my ground but I was rooted to the spot In fact, without movement I felt decidedly starved of options

Though it takes skill to judge timing I doubt the lasting attraction of this game, even though it provides the opportunity to get hammered without the risk of dislodged teeth, a broken nose and brain damage.

John Minson

Psychopathic

Program *Glass* **Price** £7 99 **Micro** Spectrum 48K **Supplies** Quicksilva, Liberty House, 222 Regent Street, London W1R 7DB

This is not just a shoot em up, this is a psychopathic bloodbath! Round after round of lasering anything that moves and/or shoots at you precedes reaching the city and nuking it! Then there are two more cities to blast to atoms before it's time to go home for dinner and an evening watching telly

As a respite from this wholesale slaughter, you have to steer, at mind warping speed, between the sort of tower blocks that Prince Charles dislikes so much (sadly you can't blast or bulldoze these) It really is quite exhilarating though collisions do the sort of shield damage that loses your no-claims bonus There are also fly pasts of space fleets to admire

The graphics are excellent, both in large scale and animation, and in the movement over the planet surface As far as appearances go it's a real good looking *Glass* (ho, ho, ho!) You can also pick up where you died, though you can't carry over your score.

In the end the game could prove rather thin, except to the aforementioned carnage merchants. You see, once you look beyond the graphics you realise there's not really that much game on the other side of the *Glass*

John Minson

Balanced

Program *Compiler* **Price** £34 95 **Micro** Amstrad **Supplier** HiSoft, 180 High Street North, Dunstable LU6 1AT

The manual for this version of C, which incidentally far exceeds the already high quality of HiSoft's documentation, begins with the comment that this is one of the most important products yet released for the Amstrad And they may not be far wrong

C is the language that is receiving the most attention in business software circles at present Whilst originally designed for systems programming giving low-level access to the hardware, it has enough high-level features to make it relatively painless to produce a wide range of software

The language manages to strike a balance between speed and efficiency flexibility and ease of use This is not to say that it makes immediate sense to someone familiar only with Basic. Part of the power of the language is that very concise shorthand coding can be used which produces fast programs, but makes Basic look positively verbose

Aside from the library functions, C is one of the most clearly-defined languages. Whilst HiSoft's C has some minor variations from the standard these rarely restrict the capabilities of the language, rather the way things are expressed The only notable omission is that there is no ability to handle floating-point numbers – not an uncommon limitation on small micro C's – and the manual hints that an up-grade including this may appear

To get round some of the interrupt and sophisticated keyboard scanning facilities of the hardware (which made HiSoft's Pascal run slower on the Amstrad than on the Spectrum) it has had to sacrifice the facility to make a controlled return to Basic either from the compiler or from stand-alone compiled code.

Still these are minor problems and the chance to gain experience of the language in your own home is something no aspiring 'serious' programmer should miss

There are relatively few primitive keywords that come as standard with the language These are based around file handling, since the original use of the language was to develop operating systems such as Unix, and are used as building blocks for more advanced routines with the screen, printer, etc, treated as special 'files' You are inevitably also provided with a library of pre-defined functions such as *putchar* for writing to the screen and some of these are so traditional they are now standard.

As with its Pascal, HiSoft has provided an extended library that gives simple access to the hardware features of the Amstrad – graphics, sound and disc/cassette handling in particular Although it will not be the most efficient way to write in C you are given every possible help to make it easy to reproduce your Basic programs at a compiled speed

It may not be for beginners – there is much more scope for spectacular errors to be made from C than Basic or Pascal – but of all the languages I have seen on the Amstrad none has impressed me as much as this.

Tony Kendle



Premium bond

Program *A View To a Kill* **Price** £10.99 **Micro** Spectrum 48K **Supplier** Domark Ltd, 204 Worple Road, London SW20 8PN

Take a look at this, 0032 (inside leg measurement)."

"It's a computer game, sir."

"And?"

"Good Lord, isn't that 007?"

"Exactly! His latest mission, supposedly Top Secret."

"It isn't a very good likeness."

"It has about the same range of expressions. I think you should investigate."

"Gosh, I like this title sequence ... just like one of his films. By the way, why do you let him do those?"

"Government cutbacks. We get a percentage of the profits."

"I'm in Paris now, driving round a maze of streets, trying to intercept a parachutist. Am I driving a dodgem ... I keep on bouncing off walls? Now I'm caught in an endless loop. I can see why he's so highly rated. It's infuriating."

"To the point of dullness."

"I'll skip to City Hall, San Francisco. Oh dear, the place is on fire. How do I get out of here?"

"That's for you to discover. Use the 'duck-shoot' selection system to search, use objects and other adventure options before you get too hot under the collar."

"This is cooler. I'm in the mines. How athletically I leap."

"Better look first. Now you're trapped at the bottom of a pit."

"Oh, it's not quite the pits."

"But will it jeopardise security?"

"I doubt it will hold much attraction except for those already in the know, sir – especially at this price."

"Considering the number who've seen the film that's an awful lot, isn't it, '32?"

John Minson

QL Leap

Program *Hopper* **Price** £14.95 **Micro** Sinclair QL **Supplier** Microdeal, 41 Truro Rd, St Austell, Cornwall PL25 5JE

What can I say, yet another from the Steve Bak/Microdeal stable – *Hopper*, it's not very hard to guess that it's a *Frogger* type game for the QL.

For the uninitiated few the idea is to leap a frog; first, across a busy road (trying to avoid getting squashed in the process), to the river bank, and then across on a variety of moving logs that keep disintegrating. The game has three levels: the easiest stage is just cross the road and the river, the second stage adds a snake as well, and in the final stage you have to avoid both the snake and a crocodile that haunts the frogs home base.

Everything that can be said about *Frogger* clones has been said, the scrolling is smooth (as we've come to expect from Microdeal) the cars look like cars, the trucks look like trucks, even the river looks like a river and it's just hard enough to cross the road and the river to remain a challenge.

It seems bizarre to find so simple a game on so sophisticated a machine and at £14.95 it's not a cheap game by Spectrum/CBM 64 standards, but, within the QL market it's a reasonable price for a reasonable piece of software.

David Storton

More myths

Program *Dun Darach* **Price** £9.95 **Micro** Amstrad **Supplier** Gargoyle Games, 74 King Street, Dudley, West Midlands DY2 8QB.

There can be few people who have not heard of this 'prequel' to the superb *Tir Na Nog*. The story concerns the early adventures of Cuhulainn who has had his charioteer kidnapped by an evil sorceress and held captive in the mythical city of Dun Darach.

You control the main character through scores of subquests on the route to his final goal, attempting to decipher the meaning and use of the various symbols and objects lying around. As has been said many times it is the closest yet seen to a true fully-animated and interactive graphics adventure.

One advance over *Tir Na Nog* are the interactive characters – there are about ten other characters with whom you must trade and swap objects to receive clues and items necessary for your success. Each of these have certain traits, likes and dislikes which have to be divined. The monetary system is also central to the game – you can buy and sell, steal objects, invest, gamble or even work to make some readies. My initial reactions to the game were not all favourable – trading to build up capital seemed tedious and the evil Greg Follis of Gargoyle had given so little away in the blurb that the first hours were spent seething with frustration and bafflement.

Then I stumbled upon a method of clocking up thousands in cash and solved the mysteries of the galleries and I now find I have reached a dangerous level of fascination with the game – food, work, whatever all take second place. Beware of this program!

This is the last in the Celtic Myth series planned from Gargoyle and it stands head and shoulders above 99% of the other releases for the Amstrad computers and although it only took ten days to convert from the Spectrum, they are studying the market before deciding whether to release *Tir Na Nog* as well.

Make it a success, pester them to death and we may persuade them.

Tony Kendle

All fall down

Program *Catastrophe* **Price** £8 95 **Micro** Amstrad **Supplier** Amsoft, Brentwood House, 169 King's Road, Brentwood, Essex, CM14 4EF.

This would have made a very good cheapie game. It is either addictive with very smooth graphics but there isn't much to the plot with only one screen and only one basic idea that goes on getting a bit harder each time

You must control a helicopter which is building something or other on an island in a bay – it all looks something like Alcatraz to me. Large building blocks appear on the top of a boat, you lift them off, drop them into position, get another one, etc. Hazards include low flying aircraft, tornadoes, earthquakes, etc. You get a bonus for completing a tower so the temptation is to build tall and thin but these structures are less stable and tend to blow down. You compete against the clock against a computerised player doing the same

Unless you have a joystick, or intend to buy one, don't touch this game with a bargepole because it is certainly not worth a combined price of about £20

The problem is that, whilst strictly speaking it is not 'joystick only' so you can't ring up Amsoft in righteous fury for them not putting a warning on the box, most owners will already know the keys that duplicate the joystick signals on the keyboard form as absolutely unplayable finger tangling combination. You have been warned

It is the sort of thing that if you got as a present you may find is surprisingly enjoyable and playable but it is far from being a landmark in software history – and isn't it time Amsoft began to do something about their games pricing!

Tony Kendle

Hide and seek

Program *Finders Keepers* **Price** £1 99 **Micro** Commodore 64 **Supplier** Mastertronic, Park Lorne, 111 Park Road, London NW8 7JL

Tomorrow is the princess's birthday and the king has no idea at all of what to get her for a present. At least, so we are told in the blurb for the C64 version of Mastertronic's successful Spectrum title *Finders Keepers*

Being one of his magic knights, you have been ordered to find a very special gift. With this in mind, you are transported to the Castle of Spriteland which is teeming with many weird and wonderful creatures.

Two courses of action are available. You can either do the dirty on the king by collecting treasure and escaping, or you can return the treasure to the king who, in his infinite gratitude, will make you a member of the famed Polygon Table. Which will you choose?

Finders Keepers is another one of those platform creations, with loads of garish colours and hundreds of sprites, but it also contains some novel features. Along with the normal joystick controls, you can also pick up, drop, examine and trade objects by using the keyboard. Joining the chambers of the castle are two fairly large mazes – both take a bit of solving

I can't say that the gameplay will appeal to everyone, but at £1 99 it's excellent value.

Tam Hussey

New seekers

Program *Mordon's Quest* **Price** £5 95 **Micro** Commodore 64 **Supplier** Melbourne House, 39 Milton Trading Estate, Abingdon, Oxon OX14 4TD

For their latest C64 game Melbourne House has decided to follow the traditional text-only adventure format. Written by the author of their *Classic Adventure*, *Mordon's Quest* certainly contains all the qualities one associates with a good adventure

At the beginning, you find yourself in a strange bedroom inside a large mansion. After a bit of exploring, you come across Mordon himself. With two screens of text he briefs you for your mission – to bring him the lost components of his precious immortality machine. Failure means the destruction of the universe

As with all good adventures, the text oozes with colourful adjectives which help to create an authentic atmosphere

Mordon's Quest represents a stiff, long-term challenge with over one hundred and fifty locations and plenty of puzzles. A worthwhile addition to any adventure fan's library

Tam Hussey

TV's video magic

***Graham Taylor** talks to some of the people behind the BBC's digital video effects*

When a celebrity on your TV suddenly shrinks in size, flips over, shoots off to the opposite corner and returns again as someone else, you may not, any longer, be surprised. But it's an effect that retains an ability to astound and amaze no matter how often it happens.

That computer generated graphics can be manipulated in surprising and logic baffling ways we accept. But when the image is 'real' like breakfast TV presenters or groups on *Top of the Pops*, we feel, if we do not actually say, "but that's impossible!"

The system for producing such effects is frequently referred to as Quantel, but this is like calling all medical plasters Elastoplast. This point was made by senior engineer John Mitchell when I visited the BBC and talked to some of the people who use the technology. "Quantel is only one of a number of devices we use which are all DVE machines" – that's Digital Video Effects.

All the machines store video images digitally and allow that information to be manipulated in certain relatively simple ways. All the twists, flips and shuntings about are the result of various combinations of squeeze, expand and position manipulations.

The BBC's armoury of video technology includes a Quantel 5001, Ado and E-Flex machines all of which turn an RGB video input into digital information and then allow you to manipulate it in real time. The machines vary, roughly, in two ways: what kinds of manipulation are possible and how many inputs are allowed.

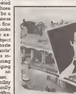
The question of inputs is very important, it distinguishes, for example, between the manipulation of one image and the moving around, within the screen of several different images. For example, in *Live Aid* – the recent pop marathon – transmission was frequently switched between Philadelphia and London. The images from the US were often shown as a small rectangle in the bottom left hand corner of the screen, when Philadelphia was ready that small image expanded to fill the whole screen.

The job of actually creating such effects is that of a video effects supervisor – that is Danny Popkin's job and he explained how he would get involved in project. "It almost always starts with a director who comes to us with ideas of certain effects he wants to achieve and it's up to us to find out how best they can be done.

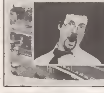
"The hardware comes with pre-programmed moves like shrinks and so on, but often we need to create our own sequences of movement. A completed movement sequence can be stored in a bubble memory or a floppy disc for repeated use. Creating those sequences can be a complex business and required a fine eye for what looks right. Take, for example, an object that has to be made to fly in 'towards' the viewer, this involves combining an ever changing position with an ever growing size.

This is a facility that is theoretically provided within some of the systems – you place your object in a start location, mid-location and end location and the gaps in between are filled in by the system, to give a smooth movement. But it's often not that easy, as Danny explained. "Often the end result will simply not look right and the effect will be spoiled so you have to divide the complete sweep of movement up into a number of smaller sections, get the machine to do each one and then put all the sections together.

Using visual effects in programs can produce a whole host of problems to do with timing, particularly in connection with sound. John explained. "When these kind of effects are used, they can cause the sound to get slightly out of sync. Because of the









short time lag it's just enough to be noticeable and so we have to delay it – getting that delay right is a matter of experience and using your eyes and ears."

Experience, too, is required to know exactly how long an effect will last accurately enough to be able to use Quantel and the other devices on live programmes like the *News* and *Breakfast Time*.

This brings out another interesting point – the visual wizardry is usually associated with flash up-tempo programs like *Doctor Who* and *Top of the Pops*, but it is used just as often, if not more so, in 'straight' information programs which are divided into a number of separate items. "It was actually the first use we put it to – it was a very good way of linking items."

If that kind of thing seems subtle in fact there are subtler uses still – as a sophisticated editing tool. "Even in serious dramas it has a use. For some technical reason it may have been impossible to do a long zoom-in on location. We can use the system to give the effect of a long camera zoom where there was none."

Danny's job is a complex mixture of artistry and hard technical knowledge. I wondered how he came to be doing it and indeed how anyone came to be working in the area of digital video effects. "I started as a cameraman and that's true of some of the other people as well, although others have an engineering background."

John added, "It's partly to do with the technology – it's a question of getting familiar with it. At first it tended to be engineers who struggled to integrate the machines. Now that that has been achieved people are used to the machines and the same skills are not necessarily required."

Danny summarised the ideal qualities. "You need some technical understanding in order to operate the machines and know their strengths and limitations but you also need some artistic skills like the ability to see what makes a good frame of picture and the best way to create a sequence of effects."



Latest developments in digital video effects systems include perspective manipulation. This means that your favourite rock band can now not only bounce around all four corners of the screen, turn upside down and back to front but can also appear to hurtle off towards the middle of the screen as though disappearing into the distance. It's an amazing illusion that will probably be used a lot for the next few months before it really gets integrated with the other techniques available.

As John commented sagely "It's like anything – when you first get it it's like a new toy, everyone wants to play with it the whole time and it tends to be overused. After a while people start using it more carefully."

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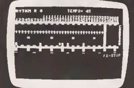
Set tempo

Hardware *Syntron Digidrum* **Micro** Commodore 64 **Price** £65 **Supplier** Vince Hill Associates, 35A Grove Avenue, Muswell Hill, London NW10.

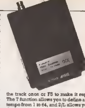
The little black box and software disc of the Syntron Digidrum efficiently converts your 64 into a digital drum machine equivalent to a commercial unit costing around £250. Like these units, the Digidrum uses sounds "sampled" from real instruments, and so is devastatingly realistic compared to the typical boom-chicka-boom home organist's drum box.

The sounds are in fact defined in software, the module (which fits into the User Port of the 64) just acting as a digital-to-analog convertor, and the unit will have an optional disc of seven new sounds when it becomes available. The existing sounds are of very high quality and suffer little from background noise – the CBM64's Sid sound chip is not used in their production.

The main menu offers five options; Program Rhythm Line, Rhythm Track Composition, Set Tempo, Load Rhythms and Rhythm Track, or Save Rhythms and Rhythm Track. Program Rhythm Line (P) calls up a complex display of a single pattern up to 38 beats long, with the Rhythm Number labelled on the top left, the Tempo on the top right and the seven available instruments listed down the right hand edge. These are C (Crash, Cymbal), O (Open Hi-Hat), H (Closed Hi-Hat), D (Drum, or Small Tom), S (Snare) and G (Grand Tom). The cursor keys are used to manoeuvre a pointer to the relevant beat, and sounds are inserted just by tapping the relevant keys. You can't play the Digidrum as a "live" drum kit, and in fact you can't even make a single pattern repeat endlessly unless you write it into a "Track".



You can compose up to ten rhythms before going on to the Track Composition page. This consists of five columns into which you enter the pattern repeats you want (for instance, Pattern 2 x 4, Pattern 0 x 2, Pattern 7 x 1), and as soon as you're happy you press F7 to play the track once or F8 to make it repeat. The T function allows you to define a new tempo from 1 to 64, and 2/L allows you to *Save* and *Load* rhythms to and from disc along with one complete rhythm track. An impressive demo track is included and you can use *Load* in the middle of Track composition to bring in another set of ten patterns.



The Digidrum software has a few problems – it's difficult to break out of Track play mode, there's a pause between Track repeats and no way to get a disc directory other than in Basic. But the sounds – a very thumpy bass drum, excellent snare and good though short, cymbals, and rather bendy toms – are, on the whole, excellent.

For those wanting to link the Digidrum to other equipment, in addition to the jack audio output there's a phono Trigger Output which produces one pulse per beat and could be used to link up older sequencers or other drum units.

The Digidrum's well up to home studio recording quality, but it's also a fascinating toy. Very good value for money.

Mark Jenkins

Memory increase

Hardware QL Ram boards **Micro** QL **Price** £89.13 (64K), £135.13 (128K), £175.35 (256K), £313.38 (512K) **Supplier** PCML, Royal Mills, Esher, Surrey (0372 67282)

With disc drive systems and 'serious' software packages now on the market the strain has been felt by the QL's 128K of on-board Ram (42K of which is gobbled-up by QDOS). In fact, the expression *Peek-L*(163840+16) – *Peek-L*(163840+12) – 512 (SV BASIC - SV FREE – space for one slave block) returns the true amount of user-available Ram which equals 87552 bytes in an unexpanded QL.

There are currently four manufacturers of add-on Ram boards – Quest Automation, Simplex Data, Medic Data Systems and PCML. Of the four, the Quest appears rather overpriced.

The PCML range includes 64K, 128K, 256K and 512K boards all of which use latest technology such that no extra power suplies are needed. The cards are all the same but use different combinations of memory chips.

I looked at the 256K Ram card, made up of just 11 chips, plus discrete components – eight memory devices, two address decoders and a special ULA-like chip which has been programmed by PCML to act as a memory controller. The circuit board has space for eight more memory chips to make up a 512K card.

The board, which measures approximately 98mm by 82mm, has been neatly designed and is compact enough to fit entirely within the QL's casing. Obviously, you will need a motherboard if you wish to connect both a disc drive interface and memory.

When you connect the 256K card, the physical memory is increased by 200% whilst the actual user-available Ram (calculated using the expression given above) is increased almost threefold. Also, the speed of programs – both SuperBasic and MC68008 machine-code – is increased by between 15% and 20%. This is because the QL's ULAs interrupt the main 128K bank of Ram in order to display the video information. Any added Ram is not subject to this interference by the rest of the QL hardware. I ran a short machine-code program loop which took 164 seconds to run in the normal 128K bank of on-board Ram but only 105 seconds in the add-on Ram space.

The other obvious advantage of having 256K of extra Ram is that Microdrive operation will be more efficient. In particular, the Psion suite benefits greatly from this.

QDOS will automatically commission more memory for use as slave blocks. This means that if you *Exec* a program from one microdrive, execute another job then *Exec* the original again without removing the microdrive cartridge, QDOS will remember that it has a copy of the program in Ram and will load that rather than examining the whole of the cartridge again.

If you do need more Ram for your QL the PCML cards seem like a good buy – they are well constructed and pitched at a reasonable price.

Alan Turnbull

High contrast

Hardware Print Technik Video Digitizer **Micro** Commodore 64 **Price** £145 **Supplier** CRL, CRL House, 9 King's Yard, Carpenters Road, London E15 2HD.

The Video Digitizer could be dangerous for those with a little imagination and an interest in computer art, because it takes you right into the high-cost world of video and digital picture modification. After half-an-hour's play with the Digitizer I was consulting my bank account to see whether it would bear the cost of a lightweight video camera.

Basically the Digitizer connects to the Commodore 64's User Port and allows it to interpret incoming video signals from a camera or video recorder. These should be straight video signals rather than composite picture/sound RF signals, although this isn't made at all clear in the four-side leaflet which accompanies the Digitizer and only became obvious through trial and error.

Loading the software leads to a menu in icon form which allows you to digitize a picture, view it on the monitor, store it to disc, store it to disc in an edited format for modification by the Koala Graphics Pad or print it out on any one of a selection of printers. If you select "Digitize", the screen goes blank for about five seconds before the digitized version of the incoming picture is revealed, the definition is pretty low from complex colour pictures, but pictures with high contrast or in black and white come out fairly well.

There are just four levels of brightness available and these can be coloured using the Function keys. You can also go to 16 colour mode, which involves loading another routine from disc (which very pleasingly uses a fast loader). 16 Colour Mode allows you to assign any colour to each of 16 shades of grey, and the resulting picture can be accurately printed on a colour printer such as the Canon 1210, Epson or GP 700A.

Black and white printing on an MPS 801 or similar is very straightforward – though you can only see about two-thirds of the digitized picture on the screen at any time, moving it around with the cursor keys, but the print function will always reproduce the whole scene. Storing scenes in Koala format (exactly as they're seen on the screen) gives you more versatility in this matter though, and you can also exit from the software without losing the digitized picture to apply your own software transformation.

Other Menu options include a light pen routine for operating the whole package and a *directory* command for a list of stored pictures. You can arrange stored pictures for an automatic "slide show" using another software routine on the disc, and the Digitizer can also be used as an alarm system, comparing successive pictures and signalling if there's any significant change. There's a test pattern which can be used to adjust the contrast, brightness and colour values produced by the Digitizer and three small potentiometers accessible from the top of the unit allow you to alter these values while the unit is working.

One of the major uses of the Digitizer would be in examining and artificially colouring black and white pictures such as satellite photos of land masses. Arbitrarily chosen colours can reveal details in shades of grey which the human eye wouldn't otherwise detect, and these can be interpreted in many ways. For the more imaginative, the system gives the possibility of transmitting pictures along the telephone network using a modem, and the possibilities for artistic applications are endless.

I enjoyed using the Digitizer enormously, but a more comprehensive and informative manual would have helped. I have few complaints about the software, which is very easy to use and the fast operation is a real bonus for the impatient video artist. Now, about that bank loan for a video camera . . .

Mark Jenkins

Solitaire

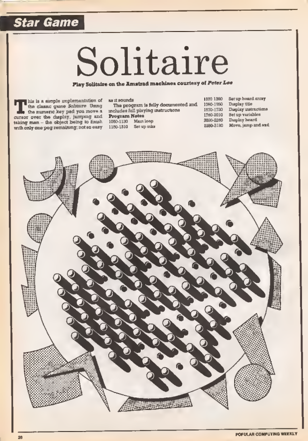
Play Solitaire on the Amstrad machines courtesy of *Peter Lee*

This is a simple implementation of the classic game *Solitaire*. Using the numeric key pad you move a cursor over the display, jumping and taking men – the object being to finish with only one peg remaining; not so easy as it sounds.

The program is fully documented and includes full playing instructions.

Program Notes

1060-1130	Main loop
1180-1310	Set up inks
1320-1380	Set up board array
1390-1550	Display title
1570-1750	Display instructions
1760-2010	Set up variables
2020-2260	Display board
2280-3190	Move, jump and end



```
1000  *********************************
1010  *** SOLITAIRE (c) Peter Lee ***
1020  *********************************
1030
1040
1050 MODE 1:DEFINT a-z
1060 GOSUB 3190
1070 GOSUB 1380
1080 GOSUB 1530
1090 GOSUB 1610
1100 GOSUB 1800
1110 GOSUB 2070
1120 GOSUB 2320
1130 GOTO 1080
1140
1150  ************************
1160  ***** Set up inks *****
1170  ************************
1180
1190 INK 0,1:INK 1,24:INK 2,20:INK 3,6:INK 4,0:INK 5,26:INK 6,13,26
1200 BORDER 1
1210 ENT  1, 1,2,1, 5,-2,1:ENV 1, 1,15,1,  15,-1,2
1220 PEN 1:LOCATE 1,12:PRINT"Are you using green screen mon itor (Y,N)";
1230 z$=UPPER$(INKEY$):IF z$="" THEN 1230
1240 IF z$<>"N" AND z$<>"Y" THEN 1230
1250 IF z$="Y" THEN INK 3,13
1260 MODE 1
1270 FOR t=1 TO 10
1280   DEF DEF t,1
1290 NEXT
1300 RETURN
1310
1320  ***************************************************
1330  ***** Set up board$, and other such arrays. *****
1340  ***************************************************
1350
1360 DIM board$(9),store$(9,31),a$(3),z$(9),z(4)
1370 RETURN
1380
1390  ************************
1400  ***** Display Title *****
1410  ************************
1420
1430 MODE 1:GOSUB 3160
1440 LOCATE 10,7:PEN 2:PRINT "Written by Peter Lee"
1450 LOCATE 5,21:PEN 3:PRINT"Do you need instructions (Y,N)?";
1460 PAPER 1:LOCATE 1,1:PRINT SPACE$(40);:LOCATE 1,24:PRINT SPACE$(40)
1470 FOR t=2 TO 24
1480   LOCATE 1,t:PRINT " ";:LOCATE 40,t:PRINT" ";
1490 NEXT
1500 LOCATE 1,25:PRINT SPACE$(40);
1510 PAPER 0
1520 z$=INKEY$:IF z$="" THEN 1520
1530 z=INSTR("YN",UPPER$(z$))
1540 IF z=0 THEN 1520
1550 RETURN
1560
1570  *************************************************
1580  ***** Display instructions if required *****
1590  *************************************************
1600
1610 IF z=2 THEN RETURN
1620 MODE 1:GOSUB 3160
1630 LOCATE 13,4:PRINT STRING$(15,45)
1640 PEN 2:LOCATE 6,8:PRINT "Use keypad to move cursor.":PRI
NT TAB(6)"Use  2  to jump/short jump."
1650 PRINT TAB(6)"Use  Q  to quit ":PRINT TAB(6)"Use  B" to move back."
1660 PAPER 1:LOCATE 1,1:PRINT SPACE$(40);:LOCATE 1,27:PRINT SPACE$(40)
1670 FOR t=2 TO 24
1680   LOCATE 1,t:PRINT " ";:LOCATE 40,t:PRINT" ";
1690 NEXT
1700 LOCATE 1,25:PRINT SPACE$(40);
1710 PAPER 0
1720 LOCATE 10,21:PEN 2:PRINT"Press (SPACE) to play"
1730 IF INKEY$<>" "THEN 1730
1740 RETURN
1750
1760  *************************************
1770  ***** Set up variables in play *****
1780  *************************************
1790
1800 RESTORE 1930
1810 FOR t=1 TO 9
1820   READ board$(t)
1830   store$(t,0)=board$(t)     store as first board.
1840 NEXT
1850 score=0
1860 r=0
1870 x=5:y=5:dx=5:dy=5:jx=5:jy=5:store$(1),0)=STRING$(8,5)
1880 xd$="1231 3323"
1890 yd$="3332 2111"
1900 MODE 0
1910 RETURN
1920
1930 DATA "000000000"
1940 DATA "000111000"
1950 DATA "000111000"
1960 DATA "011111110"
1970 DATA "011121110"
1980 DATA "011111110"
1990 DATA "000111000"
2000 DATA "000111000"
2010 DATA "000000000"
2020
2030  ***************************
2040  ***** Display board *****
2050  ***************************
2060
2070 a$=CHR$(15)
2080 a$(1)=a$+"2"+CHR$(143)
2090 a$(2)=a$+"3"+CHR$(233)
2100 a$(3)=a$+"1 "
2110 WINDOW #1 6,13,6,18
2120 FOR board=1 TO 9
2130   z$(board)=""
2140   FOR t=1 TO 9
2150     temp$=MID$(board$(board),t,1)
2160     temp=ASC(temp$)-47
2170     z$(board)=z$(board)+a$(temp)
2180   NEXT
2190 NEXT
2200 LOCATE #1,1,1
2210 FOR t=1 TO 9
2220   PRINT #1,z$(t);
2230 NEXT
2240 PLOT 0,0,4:DRAW 0,744:DRAW 639,399:DRAW 639,0:DRAW 0,0
2250 PLOT 156,275,4:DRAW 460,275:DRAW 460,127:DRAW 156,127:D
RAW 156,275
2260 RETURN
2270
2280  **********************************************
2290  ***** Do move/jump  Exits if quit or win  *****
2300  **********************************************
2310
2320 LOCATE 6,5:PEN 5:PRINT"SCORE    ";:LOCATE 12,5:PEN 6:PR
INT score;:PEN 1:LOCATE 3,24:PRINT "Use  Q  to quit"
2330 PLOT 446,400,2:DRAW 162,360:TAG:PRINT"SOLITAIRE";:TAGOFF
2340 PEN 8:LOCATE 6 3:PRINT CHR$(22)"SOLITAIRE";CHR$(22)"2";
2350 LOCATE 6,5:PRINT STRING$(8,95)
2360 IF score=31 THEN z=2:GOTO 2790
2370 GOSUB 3090:z$=INKEY$:GOSUB 3110:IF z$="" THEN 2370
2380 z=INSTR("123456789QB",UPPER$(z$))
2390 IF z=0 THEN 2370
2400 IF z>9 THEN 2670
2410 IF z=5 THEN IF MID$(board$(y),x,1)<>"1" THEN 2370 ELSE
2420
2430   ' ******** Move ********
2440 GOSUB 3100
2450 x2=x+mx:y2=y+my
2460 IF MID$(board$(y2),x2,1)="0" THEN 2370
2470 x=x2:y=y2
2480 GOTO 2370
2490   ******** Jump ********
2490 GOSUB 3110:z$=INKEY$:GOSUB 3080:IF z$="" THEN 2490
2500 z=INSTR(" 2 468 B",UPPER$(z$))
2510 IF z=0 OR z$=" " THEN 2490 ELSE IF z=8 THEN 2330
2520 IF z>9 THEN 2670
2530 GOSUB 3100
2540 jx=x+mx:jy=y+my
2550 dx=x+mx*2:dy=y+my*2
2560 IF MID$(board$(jy),jx,1)<>"1" THEN 2520
2570 IF MID$(board$(dy),dx,1)<>"2" THEN 2700
2580 store$(0,score)=CHR$(x)+CHR$(y)+CHR$(jx)+CHR$(jy)+CHR$(
dx)+CHR$(dy)
2590 LOCATE 5+x,8+y:PRINT a$(3);
2600 MID$(board$(y),x,1)="2"
2610 LOCATE 5+jx,8+jy:PRINT a$(3);
2620 LOCATE 5+dx,8+dy:PRINT a$(2);
2630 MID$(board$(jy),jx,1)="3"
2640 MID$(board$(dy),dx,1)="2"
2650 x=dx:y=dy:score=score+1:GOTO 2700
2660   ******* Quit, Back-move ******
2670 IF z=10 THEN z=1:GOTO 2730
2680 IF score=0 THEN 2370 ELSE score=score-1
2690 FOR t=1 TO 9
2700   store$(t,1)=store$(t,score)
2710 NEXT
2720 x=ASC(MID$(board$(0,score)),1)):y=ASC(MID$(board$(0,scor
e),2))
2730 GOSUB 2070:GOTO 2320
2740 FOR t=1 TO 9
2750   store$(t,score)=board$(t)
2760 NEXT
2770 GOTO 2320
2780 LOCATE 3,23:PEN 2:PRINT"You need was ";:INK 3,6,0
2790 PEN 2:LOCATE 2,24:PRINT"Any replay (Y,N) ?";
2800 z$=UPPER$(INKEY$):IF z$<>"Y" AND z$<>"N" THEN 2800
2810 FOR 3,6:IF z$="N" THEN RETURN
2820 LOCATE 2,23:PRINT SPACE$(18);:LOCATE 2,24:PRINT SPACE$(
18);
2830 tt=0:GOSUB 3180:GOSUB 2070
2840 FOR tt=0 TO score-1
2850   LOCATE 11,5:PEN 6:PRINT tt;
2860   FOR t=1 TO 6
2870     z(t)=ASC(MID$(store$(0,tt),t,1))
2880   NEXT
2890   GOSUB 3120   Restore board
2900   IF z(3)>z(5) THEN d=2
2910   IF z(1)<z(3) THEN d=3
2920   IF z(2)>z(4) THEN d=0
2930   IF z(2)<z(4) THEN d=1
2940   LOCATE z(1)+5,z(2)+8:PEN 13
2950   PRINT CHR$(22)"1"+CHR$(240+d)CHR$(22)"0";
2960   SOUND 13,50,1
2970   LOCATE 4,24:PEN 2:PRINT"Press (SPACE)"
2980   IF INKEY$(47)<>" " THEN 2980
2990   LOCATE z(1)+5,z(2)+8:PRINT a$(2);:FOR xx=0 TO 100:NEX
T
3000   LOCATE z(1)+5,z(2)+8:PRINT" ";:LOCATE z(5)+5,z(6)+8:P
RINT a$(2);
3010   LOCATE z(3)+5,z(4)+8:PRINT" ";
3020 NEXT
3030 GOTO 2790
3040 c=c+1:IF c=10 THEN GOSUB 1,40-score,10,0,1,1:c=0
3050 LOCATE 5+x,8+y:PEN 5:PRINT CHR$(22)"1"+"_"+CHR$(22)"0";:RET
URN
3060 LOCATE 5+x,8+y:temp$=MID$(board$(y),x,1)
3070 temp=ASC(temp$)-47
3080 PRINT a$(temp);
3090 RETURN
3100 mx=ASC(MID$(xd$,z,1))-50:my=ASC(MID$(yd$,z,1))-50:RETUR
N
3110 LOCATE 5+x,8+y:PEN 5:PRINT CHR$(22)"1"+"_"+CHR$(22)"0";:RET
URN
3120 FOR ttt=1 TO 9
3130   board$(ttt)=store$(ttt,tt)
3140 NEXT
3150 RETURN
3160 PLOT 000,400,2:DRAW 192,300:TAG:PRINT"S O L I T A I R E";
:TAGOFF
3170 PEN 3:LOCATE 12,3:PRINT CHR$(22)"1S O L I T A I R E";CHR$(
22)"2";
3180 LOCATE 13,4:PRINT STRING$(15,45)
3190 RETURN
```

Luck of the draw

A drawing utility that produces its own Basic program – by A Mahmood

Many drawing utility programs offer you some very comprehensive drawing facilities which normally include drawing squares/triangles/circles, etc, and then filling them in, in a certain colour. However, the one thing that most of these utilities lack is the option to use the pictures in your own Basic programs, and many of those that do offer such a facility involve using vast amounts of memory.

This program offers two simple, but effective drawing facilities, the ability to draw straight lines or curves, and draw circles. It will also generate Basic instructions and load them into a Basic line, so that when you have finished your design you have a set of Basic instructions which will recreate the same.

Now the program can be activated to self-destruct and leave you with a Basic program which will draw your design on screen and take very little memory, and also offer you the flexibility of a basic program.

First Run the program. You will now be asked to select a paper colour, enter the required background (paper) colour. You will now hear a series of short pips, this is just to tell you that Cursor One and Cursor Two are on the same coordinates. At the bottom of the screen will appear *"Select Mode"*. The Select mode offers all the following facilities:

1) The cursors can be moved using the following keys when in select mode. Cursor One (small box) - 5 - Left, 8 - Right, 6 - Down, 7 - Up. Move Cursor Two (cross) using the above and *S/Shift*.
2) Pressing *A* will allow you to change the ink colour and the over status.
3) Pressing *G* will draw/rub-out a grid on the screen.
4) Pressing *I* will allow you to see the present design stored in memory.
5) Pressing *C* until you hear a *Beep* will enter you into the circle mode.
6) Pressing *0* until you hear a *Beep* will enter you into the line/curve mode.
7) Pressing *M* will allow you to see the menu.

When in the *Circle* mode you have the following three options. Pressing *9* until you hear a Beep will return you to the select mode. Pressing *S* until you hear a Beep will store the circle drawn in memory. Pressing *3* will decrease the radius of the circle by one pixel. Pressing *3* will increase the radius of the circle by one pixel. (Cursor Two is the centre of the circle and Cursor One is ignored.)

When in the *Line/Curve* drawing mode you have the following three options. Pressing *9* until you hear a Beep will return you to the select mode. Pressing *S* until you hear a Beep will store the line/curve drawn in memory. Pressing *2* will allow you to decrease the curve by one, pressing *3* will increase the curve by one (the curve allowed is between -5 & +5). Curve 0 is a straight line. (NB The line/curve is drawn from Cursor Two to Cursor One.)

When in any of the above drawing modes, pressing *S* until you hear a *Beep* will store the appropriate Basic command in memory, however, whilst the program is doing this there may be a slight pause after which you will be in the select mode. Should, however, the message *"No More Room"* appear it simply means that there is no more room in memory to store the command, therefore you should enter a *Rem* statement followed by approximately 128 characters after the last storing line used by the program (when storing commands the program prints a line number at the bottom of the screen; this is the number of the storing line currently being used).

Should you get an error when in the drawing modes because a line, circle or curve has gone off the screen simply enter *Cls: Goto 1* and all will be OK.

When you have finished your drawing you can make the program self-destruct by firstly breaking into it and then entering *Go To 2000*. You will then be asked if you would like to self-destruct. Should you enter *Y*, there will be a slight pause and the main program will self-destruct leaving only your design in Basic lines for you to use in your own programs.

```
1 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
2 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
3 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
4 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
5 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
6 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
7 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
8 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
9 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
10 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
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18 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
19 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
20 REM aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
1000 IF FN a(23641)<>FN a(23627)+11 THEN RETURN
1001 POKE 23658,0: CLEAR : DEF FN a(i)=PEEK i+256*PEEK (i+1)
1002 LET X=128: LET Y=92
1003 LET LINE=4+FN a(23635)
1004 LET X1=128: LET Y1=92
1010 INPUT "PAPER COLOUR (0-7)";PAP: IF PAP>7 OR PAP<0 THEN GO TO 1010
1015 BORDER PAP: PAPER PAP: INK 9: OVER 0: INVERSE 0: CLS
1020 LET I=7
1030 LET DOE=0
1035 LET MENU=9000
1040 LET CURSOR=3000
```

```
1040 LET ATTRIBUTE=4000
1044 LET STORE=5400
1045 LET HOLD=6000
1046 LET DIAM=0: LET CURVE=0
1047 LET LASTX=30: LET LASTAVE=10
1048 LET LASTX1=X1+1: LET LASTY=Y1+1
1070 LET OLDX=X: LET OLDY=Y
1080 LET OLDX1=X1: LET OLDY1=Y1
1090 OVER 1: PLOT OLDX1-2,OLDY1: DRAW 4,0: PLOT OLDX1,O
LDY1-2: DRAW 0,4: PLOT OLDX-1,OLDY: DRAW 2,0: PLOT OLDX
,OLDY-1: DRAW 0,2
2000 IF INKEY$="M" THEN GO TO MENU
2020 IF INKEY$="A" THEN GO SUB ATTRIBUTE
2030 IF INKEY$>"4" AND INKEY$<="9" THEN GO SUB CURSORS
1: GO TO 2090
2040 IF INKEY$>="1" AND INKEY$<="1" THEN GO SUB CURSOR
S: GO TO 2040
2050 IF CODE INKEY$>47 AND CODE INKEY$<58 THEN GO SUB
CURSORS
2060 IF X1=X THEN IF Y1=Y THEN BEEP .01,1
2070 IF INKEY$="G" THEN GO SUB GRID
2080 IF INKEY$="C" THEN GO SUB SAVE
2090 INPUT ;: PRINT #1;"SELECT MODE"
2999 GO TO 2000
3000 INK 1: PAPER PAP: OVER 1: PLOT OLDX1-2,OLDY1: DRAW
 4,0: PLOT OLDX1,OLDY1-2: DRAW 0,4
3010 PLOT OLDX-1,OLDY: DRAW 2,0: PLOT OLDX,OLDY-1: DRAW
 0,2
3020 LET X=X+(INKEY$="8" AND X<255)-(INKEY$="5" AND X>0
)
3030 LET X1=X1+(INKEY$="1" AND X1<255)-(INKEY$="3" AND
X1>0)
3040 LET Y=Y+(INKEY$="7" AND Y<175)-(INKEY$="6" AND Y>0
)
3050 LET Y1=Y1+(INKEY$=" " AND Y1<175)-(INKEY$="5" AND
Y1>0)
3060 IF INKEY$="0" THEN GO SUB 3200
3061 OVER 1
3070 PLOT X-1,Y: DRAW 2,0: PLOT X,Y-1: DRAW 0,2
3080 PLOT X1-2,Y1: DRAW 4,0: PLOT X1,Y1-2: DRAW 0,4
3100 LET OLDX=X: LET OLDY=Y: LET OLDX1=X1: LET OLDY1=Y1
3110 OVER 0
3120 IF INKEY$="B" THEN CLS : GO SUB 1: GO TO 1070
3130 RETURN
3200 LET CURVE=0
3210 IF INKEY$="0" THEN OVER AND PLOT X1,Y1: DRAW (X-
X1),(Y-Y1),CURVE: BEEP .05,10: OVER 1:
3220 IF INKEY$="9" THEN INVERSE 1: OVER 0: PLOT X1,Y1:
DRAW (X-X1),(Y-Y1),CURVE: BEEP .05,10: OVER 1: INVERSE
0: INPUT ;: RETURN
3222 IF INKEY$="5" THEN GO TO 31000
3230 LET OLDCURVE=CURVE: LET CURVE=CURVE+(INKEY$="3" AN
D CURVE<10)-(INKEY$="2" AND CURVE>-10)
3236 INPUT ;: PRINT #1;"CURVE=";CURVE;TAB 9; FLASH 1;"5
 TO STORE    9 TO QUIT"
3240 OVER 1: PLOT X1,Y1: DRAW (X-X1),(Y-Y1),OLDCURVE
3250 PLOT X1,Y1: DRAW (X-X1),(Y-Y1),CURVE
3255 IF INKEY$="" THEN GO TO 3255
3260 OVER 0
3270 GO TO 3210
3400 BEEP .2,4: LET DIAM=0: OVER 1
3405 LET LASTX=X1: LET LASTY=Y1
3410 LET OLDDIAM=DIAM: LET DIAM=DIAM+(INKEY$="3" AND DI
AM<80)-(INKEY$="2" AND DIAM>0)
3425 IF INKEY$="5" THEN GO SUB STORE: LET LASTX=X1+1:
RETURN
3430 IF INKEY$="9" THEN INVERSE 1: OVER 0: CIRCLE X1,Y
1,DIAM: INVERSE 0: OVER 1: BEEP .1,10: RETURN
3440 CIRCLE X1,Y1,OLDDIAM
3450 CIRCLE X1,Y1,DIAM
3460 INPUT ;: PRINT #1;"CIRCLE=";DIAM;TAB 10; FLASH 1;"
5 TO STORE   9 TO QUIT"
3465 IF INKEY$="" THEN GO TO 3465
3470 GO TO 3410
3999 RETURN
4000 INPUT "INK COLOUR (0-9)";I: IF I>9 OR I<0 THEN GO
 TO 4000
4010 INPUT "OVER STATUS (0 OR 1)",OVE: IF OVE>1 OR OVE<
0 THEN GO TO 4010
4020 INPUT "": PRINT #1;TAB 13;"INK=";I;TAB 25;"OVER=";
OVE
4030 BEEP 1,30
4040 RETURN
5000 LET A$="": BEEP .1,10
5005 IF LINE-PEEK(23635) THEN GO TO 5020
5010 GO SUB 5200
5012 LET A$=CHR$ 231+STR$ PAP+CHR$ 14+CHR$ 0+CHR$ 0+CHR
$ (VAL STR$ PAP)+CHR$ 0+CHR$ 0+":": GO SUB 5100
5014 LET A$=CHR$ 218+STR$ PAP+CHR$ 14+CHR$ 0+CHR$ 0+CHR
$ (VAL STR$ PAP)+CHR$ 0+CHR$ 0+":"+CHR$ 251+":": GO SUB
5100
5020 IF LASTX<>X1 OR LASTY<>Y1 THEN LET A$=CHR$ 246+ST
R$ X1+CHR$ 14+CHR$ 0+CHR$ 0+CHR$ (VAL STR$ X1)+CHR$ 0+C
HR$ 0+","+STR$ Y1+CHR$ 14+CHR$ 0+CHR$ 0+CHR$ (VAL STR$
Y1)+CHR$ 0+CHR$ 0+":": GO SUB 5100
5025 IF LASTI<>I THEN LET A$=CHR$ 217+STR$ I+CHR$ 14+C
HR$ 0+CHR$ 0+CHR$ (VAL STR$ I)+CHR$ 0+CHR$ 0+":": LET L
ASTI=I: GO SUB 5100
5026 IF LASTOVE<>OVE THEN LET A$=CHR$ 222+STR$ OVE+CHR
$ 14+CHR$ 0+CHR$ 0+CHR$ (VAL STR$ OVE)+CHR$ 0+CHR$ 0+":
": LET LASTOVE=OVE: GO SUB 5100
5027 IF DIAM<>0 THEN LET A$=CHR$ 216+STR$ X1+CHR$ 14+C
HR$ 0+CHR$ 0+CHR$ VAL STR$ X1+CHR$ 0+CHR$ 0+","+STR$ Y1
+CHR$ 14+CHR$ 0+CHR$ 0+CHR$ VAL STR$ Y1+CHR$ 0+CHR$ 0+"
,"+STR$ DIAM+CHR$ 14+CHR$ 0+CHR$ 0+CHR$ VAL STR$ DIAM+C
HR$ 0+CHR$ 0+":": GO SUB 5100: GO TO 5044
5030 LET A$=CHR$ 252+STR$ (X-X1)+CHR$ 14+CHR$ 0+CHR$ 0+
CHR$ ABS (VAL STR$ (X-X1))+CHR$ 0+CHR$ 0+","+STR$ (Y-Y1
)+CHR$ 14+CHR$ 0+CHR$ 0+CHR$ ABS (VAL STR$ (Y-Y1))+CHR$
 0+CHR$ 0
5033 LET A$=A$+(","+STR$ CURVE+CHR$ 14+CHR$ 0+CHR$ 0+CH
R$ ABS (VAL STR$ CURVE)+CHR$ 0+CHR$ 0 AND CURVE<>0)+":"
: GO SUB 5100
5035 LET X1=X: LET Y1=Y
5040 LET LASTY=Y1
5042 LET LASTX=X1
5044 BEEP .1,1
5045 LET DIAM=0: LET CURVE=0
5070 RETURN
5100 LET A$=A$+CHR$ 224
5105 FOR C=LINE TO LINE+LEN A$-1: IF PEEK C<>15 THEN N
EXT C
5110 IF C-1<(LINE+LEN A$-1 THEN LET LINE=C+5: GO SUB 5
200
5120 IF PEEK LINE=250 THEN PRINT AT 10,10; INK 9;"NO R
OOM ROOM": BEEP 1,1: STOP
5130 FOR B=LINE TO LINE+LEN A$-1: POKE B,CODE A$(B-LIN
E+1): NEXT B
5135 LET LINE=B-1
5140 RETURN
5200 IF PEEK LINE=230 THEN PRINT AT 10,10; INK 9;"NO R
OOM ROOM": BEEP 1,0: STOP
5201 INPUT "": PRINT #1;"LINE=";PEEK (LINE-4)+256*PEEK
(LINE-3),TAB 13;"INK=";I;TAB 25;"OVER=";OVE
5203 FOR T=LINE TO LINE+900: IF PEEK T<>15 THEN POKE T
,32: NEXT T
5290 RETURN
6000 INK 0: OVER 1: FOR B=0 TO 255 STEP 8: PLOT B,0: DR
AW 0,175: NEXT B
6010 FOR B=0 TO 175 STEP 8: PLOT 0,B: DRAW 255,0: NEXT
B
6020 OVER 0
6030 RETURN
7000 CLS : PRINT AT 10,10;"QUIT (Y/N)?"
7010 INPUT "?"; LINE B$
7020 IF B$="N" THEN CLS : GO SUB 1: GO TO 1070
7030 IF B$="n" THEN CLS : GO SUB 1: GO TO 1070
7040 IF B$="Y" THEN GO TO 7050
7041 IF B$="y" THEN GO TO 7050
7048 GO TO 7010
7050 RESTORE
7055 PRINT TAB 14;"O K"
7060 FOR F=23296 TO 23296+9: READ A: POKE F,A: NEXT F
7061 IF PEEK LINE<>15 THEN LET LINE=LINE+1: GO TO 7061
7062 LET LINE=LINE+1
7063 POKE 23297,LINE-INT (LINE/256)*256
7064 POKE 23298,INT (LINE/256)
7070 LET L=USR 23296
7080 STOP
7100 DATA 17,73,93,42,75,92,205,229,25,201
9000 PAPER PAP: INK 9: CLS
9009 PRINT AT 0,14;"MENU";AT 2,14;"----"
9010 PRINT AT 3,1;"5,6,7,8 - CONTROLS FOR CURSOR 1"
9020 PRINT AT 5,1;"2,6, ,I - CONTROLS FOR CURSOR 2"
9030 PRINT AT 7,2;"PRESS 1 TO RED PRESENT OLDGEN"
9040 PRINT AT 9,2;"PRESS C TO ENTER CIRCLE MODE"
9050 PRINT AT 11,1;"PRESS 0 TO ENTER DRAWING MODE"
9060 PRINT AT 13,1;"PRESS G TO DISPLAY/RUB-OUT GRID"
9070 PRINT AT 15,0;"PRESS A TO CHANGE CURRENT COLOUR"
9080 PRINT AT 18,0; FLASH 1;" PRESS 9 TO EXIT CIRCLE/DR
AWING              MODE             "
9090 PRINT AT 21,7;"PRESS M TO SEE MENU"
9100 PRINT #0;"    PRESS ANY KEY TO CONTINUE"
9110 PAUSE 0: CLS : GO SUB 1: GO TO 1070
```

Condensed text

Text compression made easy on the BBC B with a little help from ***Jeff Tullin***

There is no doubt about it. Adventures are getting bigger all the time. Level 9, past masters at the art of creating huge adventures, surpassed even themselves when they created their 7000 room epic, *Snowball*.

What I wondered was – *How do they do it?* The answer lies in their methods of text compression, and over the next few weeks I will be showing you one way of coding text for use in your own adventures, which is fairly simple to use, and can, with care, achieve some very respectable results. (Even if not quite up to Pete Austen's awesome standards!)

This week I present the first of two 'squashing' programs. This one was written to run on the BBC as does the final assembly language 'expander' program. However, I hope to show the principles involved sufficiently to allow users of other 6502 based machines (like the Oric and Commodore 64), to make use of the series. Next week I will print a 'squash' program which will run on Microsoft type Basics, and the following week will bring the 'expander'. The assembly language used in the 'expander' has very few machine specific calls, the main idea being that, once you have a method of squashing the text in the first place, the assembler will be easy to adapt to suit any 6502 machine.

But first, the theory. Regular readers of Tony Bridge's Adventure Column will no doubt be familiar with the method by which he gives clues to those unfortunates who find themselves stuck in diverse dungeons and pits. A list of 'keywords' is given at the base of the page, and each is given a number. A typical list might be: 1) ogre, 2) jump, 3) kick, 4) up, and the clue would read something like: "3 the 1, then 2, 4," meaning 'kick the ogre, then jump up.' Substitution of words by numbers like this not only pleases those people who don't want any help by preventing them from seeing the answers accidentally, but it also saves a lot of space. This method of replacing selected words by a single number illustrates very well what the programs which follow are all about.

This week I want to concentrate on the actual squashing of the source text into its compressed form.

The first program, *Compactor* requires two things from you. The first is a list of phrases, words, or letter groups which crop up frequently in your texts. The examples held in the version printed here were for use in a 'castle' type scenario for an adventure I recently wrote. Obviously words like *castle*, *drawbridge*, *forest* and the like would not be of much use if you wanted to write an adventure about the Rebel Force battling against the Seventh Solar Empire, and this is where the work comes in. The 'dictionary' must reflect the most commonly used words in your own adventure.

As a general rule, a phrase/word/group of letters (in future I shall call this a 'token' or 'keyword') is only of value in compression if it occurs three or more times in your text. Only then can you actually claim to have saved any space. Words like *'the'*, *'I'*, *'you'*, & *'and'* are sufficiently common to warrant inclusion in almost any dictionary.

Compactor, in essence, works through all the text (which you either type in or merge in as Data at the end of the listing), and replaces any words it recognises by a single byte. Then it stores it sequentially in memory starting at (in this example) *&5200* together with the dictionary. In this way, for instance, eight or nine characters of source text can be replaced by only one character in the final, compressed version.

In order to allow you to use Teletext colour codes within the text, only ASCII codes greater than 136 are used to replace the tokens with. This gives us 119 values to play with, and indeed, the tokens in this weeks' program only total 100, so you can see that 119 is probably an ample amount.

The following notes are important:

1) To begin a new line at any time, include the character '#' in the Data.

2) A full stop in the Data heralds the end of a sentence, so the next lowercase character encountered after a full stop is automatically converted into uppercase by the expander routine. This is also true of the first letter of the text as a whole.

3) If using Teletext colour codes in the source text, always use quotes at the beginning and end, otherwise it looks very odd when you come to list it later, as these colour codes are interpreted by Basic as Basic keywords, and printed out in full as MOD or VDU, etc.

Next week, apart from the Microsoft type *Compactor* program, I'll present the flowchart for the 'expander' routines. In the meantime, happy typing!

```
10 REM Text Compactor v.1
20 REM By Jeff Tullin
30 REM BBC/ Electron (BASIC 2)
40 REM (c) 1985
50 :
60 *TV255
70 MODE7
80 FOR X= 1 TO 2
90 VDU134,157,133,141:PRINT SPC(8)"TE
XT COMPACTOR"
100 NEXT
110 VDU132,157,134:PRINTSPC(9)"By  Jef
f Tullin"
120 VDU28,1,22,39,VPOS+2
130 HIMEM=&5200
140 PROCvariables
150 PROCcreate_dictionary
160 REPEAT
170 READlong$
180 PROCsquash(long$)
190 PROCstore(S$)
200 UNTIL long$="FINISH
210 PROCstore(CHR$255)
220 PROCinfo
230 END
240 :
250 :
260 DEF PROCvariables
270 tokens=100:pointer=0
280 startlength=0:newlength=0
290 DIM T$(tokens)
300 B%=&3:P%=HIMEM:A%=0
310 long$="":short$=""
320 ENDPROC
330 :
340
350 DEF PROCcreate_dictionary
360 [OPT2
370 .dictionary
380 EQUB(13):]
390 FOR X=1 TO tokens
400 READ T$(X)
410 [OPT2
420 EQUS(T$(X)):EQUB(13):]
430 NEXT
440 [OPT2:EQUB(0):.textbase:EQUB(13):]
450 ENDPROC
460 :
470 :
480 DEF PROCsquash(long$)
490 PRINT"START ="LEN(long$),
500 startlength=startlength+LEN(long$)
510 S$="":pointer=1
520 FOR X=1 TO tokens:A%=0
530 IF MID$(long$,pointer,LEN(T$(X)))=
T$(X)THENA%=X:X=tokens
540 NEXT
550 IF A%=0 S$=S$+MID$(long$,pointer,1
):pointer=pointer+1:GOTO570
560 S$=S$+CHR$(A%+130):pointer=pointer
+LEN(T$(A%))
570 IF pointer<LEN(long$)+1 GOTO 520
```

```
580 PRINT " NOW "LEN(S$);
590 newlength=newlength+LEN(S$)
600 ENDPROC
610 :
620 :
630 DEF PROCstore(G$)
640 [OPT2:EQUS(G$):EQUB(13)]:]
650 PRINT" Last byte=&";~P%
660 ENDPROC
670 :
680 :
690 DEF PROCinit
700 VDU7
710 VDU141,129:PRINT"DICTIONARY RESIDE
S &"~dictionary," to &"~textbase
720 VDU141,130:PRINT"DICTIONARY RESIDE
S &"~dictionary!" to &"~textbase
730 VDU141,130:PRINT"SQUASHED TEXT FRO
M &"~textbase," to &";~P%
740 VDU141,130:PRINT"SQUASHED TEXT FRO
M &"~textbase?" to &";~P%
750 VDU141,134:PRINT"COMPRESSED BY "IN
T((startlength-newlength)/startlength *1
00)"%"
760 VDU141,134:PRINT"COMPRESSED BY "IN
T((startlength-newlength)/startlength *1
00);"%"
770 ENDPROC
780 :
790 :
800 REM BASIC I Users can replace all
        occurences of EQUS and EQUB by
        OPT FNEQUS and OPT FNEQUB.
810 DEF FNEQUS(M$)
820 $P%=M$:P%=P%+LEN(M$):=2
830 :
840 DEF FNEQUB(V)
850 ?P%=V:P%=P%+1:=2
860 :
870 :
880 REM    DICTIONARY
890 REM   Entries made in length
          order  le 10 chars  then
          5 chars. then 8 etc
          Max  110 entries
900 :
910 DATApassageway,there is a ,I can s
ee a ,nearby is a
920 DATA courtyard
930 DATA coloured ,peculiar,cobweb
940 DATA strange ,I can't ,already ,don
geon,window ,interest,drowned
950 DATAcurious,ground,around ,castle
,stairs
960 DATAempty ,large ,small ,dusty ,so
me ,while ,words ,tower ,rusty ,stone ,
sleep ,windy ,magic ,don't
970 DATA room ,dark ,north,south,damp
,here ,that,I ke ,door,some
980  DATAlies,old ,the ,all ,east,west
,down,must,see ,but ,too ,now ,see ,have
,top ,even,way ,ing
990 DATAyes,and,ly ,key,in ,it ,is ,el
,se ,ts
1000 DATAI ,ed,ll,me,on,en,tt,l ,e ,r ,
te,s ,t ,d ,y ,oo,th,ea,l ,in,l ,n ,e ,i
,ue,he,ah,be
1010 &&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
5010 REM  MERGE LONG TEXTS HERE
5020 REM  NB. Text should always be in
          lowercase except for effects
          Full stop causes newline and
          forced caps on next character
          Hash # causes newline only.
5030 DATA"I can see a large old door to
the south here"
5040 DATA"there is a key in the lock .I
can't turn it "
5050 DATA"a small dusty key lies on the
ground nearby "
5060 DATA"all around the castle MOAT I:
se magic stone
5070 DATA "FINISH"
```

The hidden meaning

Predict the future with this expert systems developed for the CBM 64 by ***D F Murphy***

Exsys enables a user to develop a set of rules, for prediction or for classification, from a previously built up file of observations (eg, past weather data). It does this by helping the user to discover patterns in the data, if any exist.

These rules are then applied to new data, which are decision factors, for which outcomes are unknown (eg, present weather), in order to predict the outcome (eg, tomorrow's weather).

The rules are developed interactively by being suggested by the user and tested by *Exsys*. The new data on which *Exsys* is giving probabilities for the outcome updates the existing file of observations. Thus a dynamic situation developes enabling the rules to be refined, due to the file continually changing.

It is important for the user to realise that the system works best with data which is linearly separable and relationships between variables are known and understood by the user. If this is not the case then *Exsys* will tend to operate inefficiently, which will be shown by low probability figures for forecast results.

You will find that *Exsys* may be used for prediction or classification in a wide range of applications.

This week we have printed part of the Basic listing, plus instructions for use of the program. Next week – the remainder of the listing plus a blow-by-blow dummy run.

Instructions

f7 – displays help screen

f1 – new file routine which enables you to input the name of the file and the descriptions of each of the variate fields. Upper and lower case alphabetic characters, punctuation and numbers, are permitted. A maximum of 10 characters including spaces is allowed. 'Left-arrow' enables re-input. Input names, codes, or formulae to act as memory aids when inputting information in other routines. *Return* after each input.

f2W – write data for future use, eg, if you have entered incomplete data (forecast data), for which results are not immediately available. It is best to write data after every use of *Exsys*. Keep separate data files for different subjects. If data is important then keep more than one copy of current file.

f2R – read store data. Generally speaking this will be the data you have written with the above command (*f2W*).

f33 – input result of previously stored forecast data. Displays all forecast data codes as they were input and as passed. This routine will only allow input of 1 or 0. When inputting results, data held in the data file is automatically updated and therefore when results have been input it is important to use the write (*f2W*) command to save the data.

f4 – this routine enables testing of the rulebase and is the heart of the *Exsys* system. The routine displays the rules and asks you which rule to test. You may test any rule. *Exsys* will advise you and display the 'systems efficiency' figure. It is up to the user to define the file and use the best combination of rules to increase system efficiency. Rules may be in the range

y > x (y greater than x)
y < x (y less than x)
y = x (y equals x)
y ? x (y not equal to x)

y and *x* must be in the range 0-99 (integers only). *y* is the existing variate value in each sample, which has been input by the user, using the routine at f5. When prompted by *Exsys* to input the new rule for testing, you should input the relational operator (>, <, =, or ?) then press return, then input the number, (x), and press return again. Initially rules are set to '= 0'. It is best to ignore *Exsys* advice at first, until a rule base has been built up, to 'get the system going'.

f5 – this routine enables the user to input data for which a forecast is required. The code may be a name or a number or any combination of alpha numeric characters, up to 7 characters long.

The input under each heading, which corresponds to the variate names in the displayed panel, may be from 0 to 99 (integer values only). A maximum of 80

```
1 REM************************************************************
2 REM              COPYRIGHT OF D.F.MURPHY
3 REM                           [illegible]
4 REM                           [illegible]
5 REM                           ANGLESEY
6 REM                           [illegible]
7 REM************************************************************
8
9 REM************************************************************
10 REM            EXSYS MAIN PROGRAM-INITIALIZE
11 REM************************************************************
[illegible]
```

```
5100 REM**********************************************************
5110 PRINT"[illegible]  LINE=7 PL=10 PN=27
5130 PRINT"[illegible] DATASETTE PRESS - WHEN READY"
5140 GET W$:IF W$<>"P"THEN 5140
[illegible]
5300 REM**********************************************************
5301 REM                      WRITE
5302 REM**********************************************************
[illegible]
```

sets of data may be input and this may be split into pages as required by the user. The system will default to a new page after 18 sets of data on a page

To select a new page press f8. The figure under p% is the probability of the result given the set of events represented by the data.

f6 – this command enables you to print out data on a CBM printer. IEEE 488 printers as used on CBM business machines may be used with an Interpod interface. Output has been properly formatted for ease of use

There is no need to use the 'Help menu' between commands and, subject to system restrictions resulting in error messages if illegal commands are given, the user may enter any routine from any other routine, which saves time

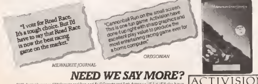
The 'left-arrow' key enables the user to re-input a piece of data prior to pressing return. Pressing *Return* without any input will default the input to 0

There are five system error messages:

1. *? results input required* – forecast data awaiting results, you may not change rules in this state
2. *? insufficient* data – sensible calculations impossible, more data required.
3. *? no data for results* – you are trying to access f3 but you have not read in file or input forecast data
4. *? new file input required* – you need to read in a data file or call f1 routine
5. *? variate/result name required* – call routine f1 as there is no description for the variate specified, or the result.

To save typing the program in, send £3 to myself, D F Murphy, at Llanerch-y-Mor, Marianglas, Anglesey, Gwynedd, LL73 8PA and I'll send you off a tape

```
5602 REM[illegible]
5610 FORL=0TOTSX-1 INPUT#1 TBK(L)
5620 FOR R=0TO9 INPUT#1 TBX(L R) NEXT
5630 NEXTL RETURN
5700 REM[illegible]
5701 REM                    WRITE-IF TBX
5702 REM[illegible]
5710 FORL=0TOTSX-1 PRINT#1 TBK(L)
5720 FOR R=0TO9 PRINT#1 TBX(L R) NEXT
5730 NEXTL RETURN
5900 REM[illegible]
5901 REM                    STOP ON DATASETTE
5902 REM[illegible]
5910 PRINT"PRESS STOP ON DATASETTE"
5915 IFPEEK(1)<>55 THEN 5915
5920 RETURN
6000 REM[illegible]
6001 REM                    RESULTS
6002 REM[illegible]
6010 IF RF%=0 THENGOSUB12110 RETURN
6015 [illegible]
6020 [illegible]
6025 [illegible]
6026 [illegible]
6030 [illegible]
6050 [illegible]
6057 [illegible]
6060 [illegible]
6065 [illegible]
6075 [illegible]
6080 LINE=LINE+1 FC=FC+1 NEXT
6070 PL=11 PR=PL
6080 [illegible]
6090 [illegible]
6095 [illegible]
6097 [illegible]
6100 LINE=LINE+1 FB=FB+1 NEXT
6170 [illegible]
6190 [illegible]
6200 REM[illegible]
6201 REM                    INCREMENT PROBABILITIES
6202 REM[illegible]
6210 [illegible]
6220 [illegible]
6290 RETURN
6300 REM[illegible]
6301 REM                    WRITE OVER OLDEST SAMPLE
6302 REM[illegible]
6310 [illegible]
6350 [illegible]
6390 RETURN
6400 REM[illegible]
6401 REM                    ADD TO EXISTING SAMPLES
6402 REM[illegible]
6410 [illegible]
6430 [illegible]
6690 RETURN
6700 REM[illegible]
6701 REM                    DECREMENT PROBABILITIES
6702 REM[illegible]
6710 [illegible]
6720 [illegible]
6790 RETURN
7000 REM[illegible]
7001 REM                    RULE TEST
7002 REM[illegible]
7010 [illegible]
7020 [illegible]
7030 [illegible]
7040 [illegible]
7050 [illegible]
7060 [illegible]
7062 [illegible]
7070 [illegible]
7090 [illegible]
7100 [illegible]
7110 [illegible]
7120 [illegible]
7130 [illegible]
7140 [illegible]
7145 [illegible]
7150 [illegible]
7160 [illegible]
7170 [illegible]
7270 [illegible]
7275 [illegible]
7300 [illegible]
7320 PRINT"[illegible]PROPOSED SYSTEM EFFICIENCY [illegible]"
7330 [illegible]THE NEW RULE"
7340 [illegible]SUGGEST YOU [illegible] THE NEW RULE"
7345 [illegible]YOU MAY INCLUDE OR REJECT NEW RULE"
7390 [illegible]RETURN
7400 REM[illegible]
7401 REM                    NEW RULE PRESENT?
7402 REM[illegible]
7410 [illegible]
7420 [illegible]
7430 [illegible]
7440 [illegible]
7450 [illegible]
7490 RETURN
7500 REM[illegible]
7501 REM                    [illegible]
7502 REM[illegible]
7510 [illegible]
7520 [illegible]
7530 [illegible]
7540 [illegible]
7550 [illegible]
7560 [illegible]
7570 [illegible]
7590 [illegible] RETURN
```

No restrictions

A sophisticatad input routine for a variety of program types from the keyboard of ***Jonathan Prestidge***

If you have ever tried your hand at the odd data base or two, then you will probably know what a chore doing all that validation is. You might only have a few inputs in your program but once you have got down to the nitty gritty of making your program foolproof then you could end up with a monster of a listing.

Well, this monster of a listing is a procedure which does the bulk of the validation for you ... but that's by no means its sole purpose. It does much to improve the appearance, user friendliness and power of your program for the user, and legibility of the program for you the programmer, since it takes just one command for one input allowing many features to be included.

I know the listing looks long (probably because it is!) but you only have to type it in once, and after that you can use it limitlessly in your programs. I use an input routine at work (which isn't nearly as flexible as this one) and I suspect many other professionals do too, because it offers the advantages of defining fields in a data base language with none of the restrictions.

Basic input statements also present restrictions, for instance you can't detect when a function or escape key has been pressed during one, whereas this routine automatically detects them and exits the input telling you which was pressed.

Before an input, the field is displayed with underlined characters (or a character that you can specify) to show the user just what is expected, length and format wise, giving it a professional look. Error messages are another thing the routine takes care of for you. One of the procedures best features is the way it displays the majority of the error messages instantly, if the user types in a character which is not allowed in that input or position then he or she won't have to wait until they press *Enter* to find out their error.

The Syntax of the command which calls the procedure is as follows:

Input – At line, column, format, [field], [ranges], [qualifiers]

Line is the line on the screen where the input will take place. *Line* is an integer between 0 and 23 (same as Basic *At* statement)

Column is the column on the screen where the beginning of the field will be positioned, it must be an integer between 0 and 84 (same as Basic *At* statement)

Format is (not surprisingly) the format of the field. *Format* is a string which consists of formating characters (see TAble One for their meanings). The format characters are similar to those used in Cobol to define fields but there's many more to choose from. The data that the user types in will be restricted to this format for this input. For instance, if you want a field/input to be numeric only and have a maximum of three characters, then you would use the format string *"999"*. For a field allowing letters only, the first letter being a capital and the rest lower case with a maximum length of 10 characters, you would use this string: *"Aaaaaaaaaa"*. The interesting thing about the formatting characters for upper and lower case letters is that they actually change the characters being input to suit their format.. eg, if the user types a capital letter in a position that has a lowercase letter format then it will appear on the screen as a lowercase letter.

You can mix the formatting characters freely in any order. Some valid examples are *"A999"*, *"1MMSC"*, *"XMMMMMMM"*, *"£ZZZ9.99"*, *"99/Aaa/1299"*, where the first three examples are straight forward and as described above. The other two use characters that you won't see in Table One, ie, the slash & pound sign. In fact, these characters will be displayed on the screen (and the same goes for any other character not in Table One). So the penultimate example will appear in the running program as '£____.__' which is a very neat and easy way of doing things. The last example would appear in on the screen as '__/___/____'. Note that the user will not be able to type over these non-format characters.

More details and the rest of the listing next week.

```
1000 LET USER1$ ="£.$" : LET USER2$ = "0" : LET USER3$ = "1234567890ABCDEF"
1010 LET ECHAN = 3 : OPEN #ECHAN, SCR : WINDOW #ECHAN, 400, 23, 56, 256-25 :   CSIZE #ECHAN, 1,0 : BORDER #ECHAN, 1,7 : PAPER #ECHAN
, 2 :              INK #ECHAN, 7: REMark Set up error window (position & size optional)
5000 REMark                                                                  # PROCEDURE: input_at   #
                             # Version 1.03         #                                                  # J.E.Prestidge 1985
 #                                      #___________________#
5010 DEFine PROCedure INPUT_AT( LIN, COL, TYPE$, FIELD$, RANGE$, QUAL$ )
5020 IF "NO BUF" INSTR QUAL$ THEN LET A = KEYROW( 1 ) :              REMark if 'no buffer' qualifyer then clear k-board bu
ffer
5030 IF "NO RET" INSTR QUAL$ AND INKEY$ = CHR$( 13 ) THEN              LET A = KEYROW( 1 ) : GO TO 5030 : REMark 'no ret
urn' qual
5040 IF "QUIET"  INSTR QUAL$ THEN LET EBEEP = 0 : ELSE LET EBEEP = 1
5050 IF "WAKE"   INSTR QUAL$ THEN BEEP 500, 10 : REMark Wake-up'
5060 IF "NO SP"  INSTR QUAL$ THEN LET NO_SPACES = 1 : ELSE NO_SPACES = 0
5070 LET MIN_NUM = 0 : IF "LENGTH = " INSTR QUAL$ THEN LET A$ = "" :          FOR A = "LENGTH = " INSTR QUAL$ + 9 TO LEN( QUAL$
 ) :                 IF QUAL$( A ) >= "0" AND QUAL$( A ) <= "9" THEN LET A$ = A$ &               QUAL$( A ) : NEXT A : END IF
 : LET MIN_NUM = A$
5080 LET CCHAR = "CURSOR = '" INSTR QUAL$ :                          IF CCHAR > 0 THEN LET CUR$ = QUAL$( CCHAR + 10 ) : EL
SE CUR$ = " "
5090 LET CCHAR = "BACK = '" INSTR QUAL$ :                            IF CCHAR > 0 THEN LET BACK$ = QUAL$( CCHAR + 8 ) : EL
SE BACK$ = "_"
5100 LET START = 0
5110     ALLOWED$      = "AaMXxCs&I#9123" : REMark All the formats.
5120     ALPHA_ALLOWED$ = "AaMXxC"        : REMark alpha-Numeric formats.
5130     OUT$  = CHR$( 10 ) & CHR$( 27 ) & CHR$( 232 ) & CHR$( 236 ) &              CHR$( 240 ) & CHR$( 244 ) & CHR$( 248 ) &
 CHR$( 208 ) &              CHR$( 216 ) : REMark Codes of all Exit keys e.g. RETURN
5140     NUM   = LEN( TYPE$ )
```

```
5150    ER$  = "OK"
5160    PLACE = 1
5170    NSYM$ = "+-/*^"                        : REMark math symbols permitted
5180    SYM$  = "@#$%^&*[]-+=~\|{}:;'<>,.?/" & CHR$( 34 )
5190    NUM   = LEN( TYPE$ )
5200    CP    = 1                              : REMark Cursor - position.
5210    E$    = " ERROR :- "                   : REMark Error message prefix.
5220    INP$  = FILL$( " ", NUM )
5230    DOT = "." INSTR TYPE$
5240 AT LIN,COL; : PRINT INP$
5250 IF DOT THEN LET START = "." INSTR FIELD$ : IF START THEN                INP$( DOT - START + 1 TO DOT ) = FIELD$( 1 TO STA
RT ):                   INP$( DOT TO ) = FIELD$( START TO ) : GO TO 5300
5260 FOR A = 0 TO NUM - 1
5270   IF TYPE$( A + 1 ) INSTR ALLOWED$ THEN LET START = A : GO TO 5290
5280 NEXT A
5290 IF FIELD$ <> "" THEN INP$( START+1 TO LEN(FIELD$) + START ) = FIELD$
5300 LET ZERO$ = "0" : IF "0 = 0" INSTR QUAL$ THEN LET ZERO$ = "0"
5310 FOR A = 1 TO NUM
5320   IF TYPE$( A ) = "9" AND INP$( A ) = " " THEN LET INP$( A ) = "0"
5330 NEXT A
5340 FOR A = NUM TO 1 STEP -1
5350   AT LIN, COL + A - 1;
5360   IF INP$( A ) <> " " THEN GO TO 5390
5370   IF TYPE$( A ) INSTR ALLOWED$ THEN PRINT BACK$
5380 NEXT A
5390 FOR I = 1 TO NUM : AT LIN, COL + I - 1; :                    IF TYPE$( I ) INSTR ALLOWED$ = 0 THEN PRINT TYPE$(
I ) : END IF  :          AT LIN, COL + I - 1 :                              IF INP$( I ) <> " " THEN IF INP$(
I ) = "0" THEN PRINT ZERO$ :            ELSE PRINT INP$( I ) : END IF  : END IF  :        NEXT I
5400 REMark                                                                   M A I N   L O O P

5410 LET I$ = INKEY$ : I = CODE( I$ ) : CT$ = TYPE$( CP )
5420 IF CT$ INSTR ALLOWED$ = 0 AND CP < NUM THEN LET CP = CP + 1 :        GO TO 5400
5430 IF I = 241 THEN IF "DEFAULT =" INSTR QUAL$ THEN LET I = 10 :         INP$ = FILL$( " ", NUM )
5440 IF I = 0   THEN GO TO 5820 : REMark nothing pressed so do cursor
5450 IF I = 245 THEN LET PLACE = CP : GO TO 5400 : REMark col. count reset
5460 IF I < 37 OR I > 191 THEN GO TO 5760 : REMark not a displayable char'
5470 IF CT$ INSTR ALPHA_ALLOWED$ THEN GO TO 5670 : REMark Not numeric.
5480 REMark ======== Checks on numeric / symbol types ==================
5490 IF CT$ = "s" THEN IF I$ = "x" OR I$ = "X" THEN LET I$ = "*"
5500 IF CT$ = "s" THEN IF I$ INSTR NSYM$ = 0 THEN                         DISP_ERROR E$ & "Math Symbols Only (" & NSYM$ & "
)" : GO TO 5400
5510 IF CT$ = "S" THEN IF I$ INSTR  SYM$ = 0 THEN                         DISP_ERROR E$ & "Symbols Only" : GO TO 5400
5520 IF CT$ INSTR "109" AND I$ = "," THEN GO TO 5950
5530 IF CT$ = "9" AND I$ = " " THEN LET I$ = "0" : I = CODE( I$ )
5540 IF CT$ = "9" THEN IF I < 48 OR I > 57 THEN                            DISP_ERROR E$ & "Numeric Only" : GO TO 5400
5550 IF CT$ = "Z" OR CT$ = "B" THEN IF ( I < 48 OR I > 57 ) AND I <> 32  THEN DISP_ERROR E$ &"Numbers Or Spaces Only" : GO
 TO 5400
5560 IF CT$ = "Z" THEN GO TO 6120
5570 IF CP < NUM THEN IF TYPE$( CP TO CP + 1 ) = "98" AND I$ = " " AND    INP$( CP + 1 ) <> " " THEN DISP_ERROR E$ &
                     "Two Part Numbers NOT Allowed" : GO TO 5400
5580 IF CP > 1 THEN IF TYPE$( CP - 1 TO CP ) = "B8" AND I$ <> " " AND     INP$( CP - 1 ) = " " THEN DISP_ERROR E$ & "Disjoi
nted Number" :          GO TO 5400
5590 IF CP > 1 THEN IF CT$ = "9" AND TYPE$( CP - 1 ) = "Z" THEN GO TO 6120
5600 IF I$ = "0" THEN I$ = ZERO$
5610 REMark ============== checks on user types ======================
5620 IF CT$ = "1" THEN IF I$ INSTR USER1$ = 0 THEN DISP_ERROR E$ &       "Out of Range : " & USER1$ : GO TO 5400
5630 IF CT$ = "2" THEN IF I$ INSTR USER2$ = 0 THEN DISP_ERROR E$ &       "Out of Range : " & USER2$ : GO TO 5400
5640 IF CT$ = "3" THEN IF I$ INSTR USER3$ = 0 THEN DISP_ERROR E$ &       "Out of Range : " & USER3$ : GO TO 5400
5650 IF ERR = "ERROR" THEN DISP_ERROR "Illegal Action." : GO TO 5400
5660 REMark ============== checks on alpha types =====================
5670 IF CT$ = "a" OR CT$ = "x" THEN IF I >= 65 AND I <= 90 THEN           LET I$ = CHR$( I + 32 ) : I = CODE( I$ )
5680 IF CT$ = "A" OR CT$ = "X" THEN IF I >= 97 AND I <= 122 THEN          LET I$ = CHR$( I - 32 ) : I = CODE( I$ )
5690 IF CT$ = "A" THEN IF ( I < 65 OR I > 90 ) AND I <> 32 THEN           DISP_ERROR E$ & "Letters or Spaces Only." : GO TO
 5400
5700 IF CT$ = "a" THEN IF ( I < 97 OR I >122 ) AND I <> 32 THEN           DISP_ERROR E$ & "Letters or Spaces Only." : GO TO
 5400
```

The Music Box



Commodore music

Last week I mentioned the Commodore 64's international importance. Proof of that, if it be needed, comes in the form of a book I have received from Italy called *Musica Elettronica Con Il Commodore 64* by Franco Fabbri, published in 1984 by Arti Grafiche Ricordi of Milan.

The title, of course translates as *Electronic Music With The Commodore 64* and Fabbri – an Italian theorist of contemporary music and a publisher in his own right – is well-known for his contributions to the field of electronic music.

As a matter of fact, at around the same time as the Commodore 64 book was published, Fabbri produced a gloriously illustrated coffee-table book entitled *Electronics and Music*.

The 64 book, at least, demonstrates that this home computer can be considered a significant tool in computer music. I should say that Fabbri is looking for an English publisher for his book (he already has a translation), so if anybody's interested, they could get in touch with me.

The book is sold along with a cassette of the 15 programs contained in the text, including a very effective sequencer.

Among the other programs are demonstrations of most of the Commodore's facilities, a synthesiser and a number of practical music programs.

All of them are extremely well presented and assuming you can cope with the instructions in Italian, can be unreservedly recommended. The text itself is short and to the point of the Commodore and Fabbri's programs.

The combination of book and programs on tape (or disk) is underexploited in this country. Fabbri's work is welcome from this point of view alone.

Beyond the way in which the book and programs together illuminate the processes of sound synthesis, sequencing and so on, the programs themselves are of a uniformly high quality.

I will, of course, be happy to pass on letters to Franco Fabbri from anyone who wishes to get in touch.

Incidentally, my attention has recently been drawn to the existence of a computer music course at the City University in London. As yet, I have received no details of this.

If any *Popular* readers have experience of any courses in the field, I'd be most happy to hear from them and pass on any useful information to other readers through these pages.

Gary Herman

The Music Box is a weekly column with news, reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to drop a line explaining what they're doing to Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2H 3LD

Book *Castles and Kingdoms* **Price** £5.99 **Micro** Commodore 64 **Supplier** Virgin Books 328 Kensal Road, London W10 5XJ

The great listing debate continues. I've never been a fan of books of listings; they usually seem a lot of effort for a little result.

Certainly Basic arcade games are a turn off, although a better argument can be made for adventures.

Castles and Kingdoms adds a new layer of sophistication for the type-it-in dragon-slayer as its 15 adventures are interlinked, each supported by a short introductory narrative. This framework of a unified world helps compensate for their necessary relative shortness.

Each adventure also has a somewhat different character from its neighbour.

It's a nicely produced book (no direct reproduction of dot matrix print-out here) in large format and the price is reasonable, so if you don't object to all that time spent at the keyboard it's certainly one of the better volumes of listings.

John Minson

Book *Writing Educational Programs for the BBC and Electron* **Price** £8.99 **Micro** BBC & Electron **Supplier** Macmillan London, 4 Little Essex Street, London WC2R 3LF

Of all the programs I see, the educational market contains the most turkeys, demonstrating the most basic programming faults (pun intended). Carice and Harrison have set out to banish such ineptitude by enthusing – nay, evangelising – the cause of structured programming, making great use of the Acorn machines' procedure facilities.

What raises the book above being mere succession of 'Def Proc's is its discussion of what's going on and the preplanning necessary to produce a worthwhile educational program. It's sad, therefore, that the major examples fall back on old favourites like *Mathematical Invaders*. Lack of imagination is the other curse of this genre.

Somewhere in there, there's also a program packer, somewhere being the operative word because with so many useful routines it's ludicrous to omit an index.

Despite this it's a useful book. I only hope its effects show in future educational packages.

John Minson

Book *Programming in Micro-Prolog* **Micros** Various **Price** £3.00 **Supplier** Ellis Horwood Limited Market Cross House Cooper Street Chichester, West Sussex PO19 1EB

Micro-Prolog is one of the lesser known languages, not having had the publicity of Forth or Logo for home use.

Its specialities appear to be data handling and the demonstration of limited 'intelligence' in so doing, plus the ability to enter program logic directly hence its name.

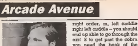
It's now becoming more readily available for a range of micros and while this volume concentrates on examples from the Spectrum version, most should be portable.

In fact, it's well supplied with demonstrations of how to put the theory into practice.

Obviously this hardback book is primarily intended as a school/higher education text and will be most valuable with tuition.

However, other experimenters or those with a dedicated interest in Artificial Intelligence, expert systems or other fields needing sophisticated list handling, will find this book at least worth looking at.

John Minson



Mapped out

As promised here is the solutions to the game *Entombed* by Ultimate for the CBM 64, thanks largely to Kenneth Devlin of Inverlop who finished it in the small hours of 9th June and drew the map. We also have to thank Marc Francois of London (finished on 22nd June), Gary Cleaver of Winkfield (21st June) and Stuart Shupp of Ashtead (who has the strangest address I have ever seen and finished on 19th June). The tips are compiled from all of your letters and I am grateful to all of you for them.

The general feeling is that the game is superior to *Staff of Karnath*, with better puzzles, although it doesn't seem to have taken you so long to finish. The start location marked A on the map is also the finish, the exit is behind the statue on the left – once the chamber is left you cannot return until you have the Scroll of Thoth. This in turn is in a room that cannot be entered without seven other scrolls. There are 21 chambers, seven objects and seven levels and the exits to each one are through various protected rooms

General tips – do not attempt chamber U, it is a dead loss (literally). In the corridors a falcon flies past carrying a cross – jump at it and strength is replenished. On level 7 if you walk past the crocodile room till it is off screen, turn back and enter you get extra lives.

Exits to next level. C dodge beneath the monster when it moves up F stand on the left of the object and whip it out of the way H – the statue will move if you have the idol from room G L to move the boulder go up the ramp and jump up and down on the leftmost slab O is the chamber of pools, the left one makes you visible, the middle invisible and the right eaps you unless you do it in the right order, ie, left middle right left middle – you should end up able to go through the exit E to get past the cobra you need the book of the dead Walk towards the cobra, a grating falls and blocks your exit and the grating in front raises letting the cobra out Go up the ramp towards the chest and all will be well.

Objects. B the whip D the bowl of fruit – to get rid of the mummy get the Knot of Isis G the small idol K the book of the dead – to get it you need the bowl of fruit Jump over the crack and walk to the plinth. M the lamp. Use the whip on these gongs in turn and notes should chime the music in *Close Encounters* – yellow, green, one below the yellow, middle, one below the green – a chest should appear – if you mess it up you must leave and start again R – Knot of Isis – whip pots till they fall and statue will move.

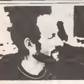
Scrolls E jump the snakes I when bird drops a jewel jump to catch it – a note sounds Walk to right and put jewel in pot The sun moves up, the moon and the pot move down This has to be done seven times. J dodge under the first and last monster, jump over the middle one N the chamber is dark – the torch is useful till you know your way about. P the chamber is dark with the same layout as E Q in here you turn invisible – the layout is as H T is dark with the same layout as J

With seven scrolls a new room V appears – avoid the clouds, up the ramp and push the boulder to the edge and time it so that it falls onto the boat If you miss, leave and re enter Take the scroll to the start

Finally here is a cheat tip – *Load* game If you are brave enough, reset computer by touching pins 6 and 2 of serial I/O port with a wire, see user manual (once again we disclaim responsibility if you do this and end up with fried chips) *Poke* 27840,96 (ret) *Sys 2560* to start. This stops the decrease in strength allowing you to practice. However, the chamber with the Scroll of Thoth becomes corrupted so you cannot finish the game unless you do it the hard way

Tony Kendle

Tony Bridge's Adventure Corner



Eternal problems

Adventures are the same all over the world, and Craig Jopham from South Africa is one who suffers from the eternal problem – while we are slumped over the hot keyboard, our bodies quivering and red eyes bleary, others in the house are trying to lead a normal life around us.

He's worked on and completed a lot of adventures, but the Carnell/Mastertronic program, *Wrath of Magra* has finally brought him to a standstill. He's having trouble getting out of the first part of the adventure, which is a three-part game. The key to solving this problem, Craig, is to be found in *The Book of Shadows*, the thick tome that accompanies the tapes. I imagine that you have this book, even though Mastertronic tell me that they don't market the program in South Africa – obviously you have the program! If you do, you'll have come across the runes on Pages 140-141, and these must be decoded in order to work round the various problems. I quite like the idea of having problems to solve outside of the adventure, for example in an accompanying book, as in this case.

First of all, get into the Wizard's Tomb (*Enter Tomb* will do nicely), and then read the runes on the sarcophagus. This will give you the password that opens the sarcophagus (oh, all right, it's *Kaju*). Now get the Wizard's Dust and make your way to Skull Cave. Here, you must throw or drop the dust and say another cryptic word (again, translated from *The Book of Shadows*), which is *Blaam*. This should get you into the second part of the program. In the second part, you must nurse your strength and possessions, by doing simple spells such as *The Clay Man Spell*.

I realise that you won't see this for some time, Craig, but I hope you haven't exploded yet!

Fantasia Diamond from Hewson Consultants is one of the great adventures for the Spectrum. Peter Hill of Brierly Hill has noticed, by reading *Adventure Helpline*, that many people are having problems with crossing the River. This is very near the start, so obviously, the major part of the game is not available to many adventurers. There is a boat here, on the opposite shore. If you wait long enough, it will eventually drift across to you, and then you can use it. First of all, Boris must be sent over – wait again and the boat will re-appear, upon which you can cross the river yourself.

Hewson has a good catalogue of programs, mostly for the Spectrum – the other traditional adventure for which they are noted is *Quest*, while *Avalon* and *Dragontorc* are arcade-ish adventures which have bought them great success and which I believe come close to integrating the puzzles of text adventures with sophisticated animated graphics – though I think that both suffer.

Scott Graham says "*Quest* is absolutely brilliant, but doesn't seem to get much coverage in the magazines, which is a pity. My problem is getting into Castle Oops. I know that you need the long key, but I can't find it. Is it beneath the trapdoor (I can't open that)? The scroll promised to give a valuable clue but hasn't yet – has the 'change' mentioned got something to do with the 'glittering walls'?"

You must have only just started reading The Corner in the last 12 months, Scott. The July 26 1984 issue contained a detailed dissection of *Quest* and this very problem was also covered in at least three issues before that! With so many wonderful new programs appearing almost every week, each one of which demands more space than we have, it is difficult to keep discussing older programs, good though they are. As you know, I try to keep interest alive in the more ancient games, partly for the sake of new readers, but mostly because I believe that adventures, unlike arcade games, never really date or show their age. To quickly answer your problems:

The long key is to be found in the low foothills, just south of the tubby goblin but it won't appear until you have dispatched the mindflayer. Now you can open the door to Castle Oops, but the words are rather unfairly obscure, and have held up many an adventurer – you must type *Open South*. To me, this is an example of the worst kind of 'word-matching'. Owners of *Fantasia Diamond*, however, will see that this very problem is covered quite extensively in the documentation. As for the cryptic scroll clue: just change the word *Slight*, geddit?

Quest has always received a lot of praise from adventurers, not least because of its simplified version of *Dungeons and Dragons*-type combat, allied with the same sort of character-building. Thus, the player can choose to be a Wizard, Cleric, Rogue, Fighter or Simpleton, with the attendant attributes. Combat is achieved in much the same way as in *D and D* with dice totals and adds, and there is a host of spells to be used (in fact, the documentation spends so long on these aspects, that it finally has no room to explain the weird input requirements). Overall, though, a program well worth seeking out.

System 1500 is an adventure from Craig Communications about hacking into a large Prestel-like database. It seems to have been quite successful and well-received, so a letter offering help may be of interest. Chris Jay writes from Bradford to say: "The main problem seems to be on the Selcra board. Log-on to the message board and leave the following message, *Selcra Vinchetta* (incidentally, first withdraw the money from Vinchetta and transfer to Comdata). Now log-on to the Selcra board (the password is *Arcles*, Selcra backwards), the ID code being 'V'. If you need more help, write to me, with a SAE, at 1D Lodge Gate, Denholme, Bradford, West Yorks BD13 4BB."

Tim Coxon has much the same advice, except to add: "The data on Vinchetta can be used for Big Apple Investments by entering Selcrabigapple and 'b' for the ID on Selcra. Can anyone tell me what use Silsey data can be put to?" Tim is at South Goringlea Farm House, Harbolets Road, West Chiltington, West Sussex.

Mike Richards offers help in *Urban Upstart*. Write to him at 8 Victoria Road, Roche, Cornwall. Robert Branch, a 14-year-old Spectrum user, would like a pen-pal with whom he can swap hints. He's completed the Artic series, *The Hobbit* and Shepherd's *Inferno*. As for *Snowball*, Robert, you must *Move Machine* to escape the padded cell. He's at 2 Woburn Avenue, Elm Park, Hornchurch, Essex RM12 4NG. Jens Danneschewski is from Bielefeld in Germany and is stuck in *Waxworks*. To block the trap door in the torture chamber, Jens, try *Fix Trap Door*. If you want to write to Jens, here's his address: Detmolderstr, 104A, 4800 Bielefeld, West Germany.

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Computer Show	July 28 10.30am-5.00pm	Cornbow Hall Hagley St Halesowen	50p	CJS/Northleach 08016 898
The Micro Trend 85	Aug 11	Burnley General Hospital	50p adults 30p children	Focus Computer Services 0282 33061
Small Business and Sales Computer Exhibition	Aug 19-20 10.00am-5.00pm	Goldsbygreen Timber St Chippenham Wiltshire	£1.50 adults £1.00 children	Kevin Angell/ Simon Mann 0249 666444
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Jewels of Babylon on Amstrad. Have solved this and Forest at Worlds End Message from Andromeda Send SAE for help Andrew Walton, Finlow Hill Cottage Over Alderley Macclesfield, Cheshire SK10 4AG

Emerald Isle on BBC B. How do you get to ... in the canoe? Ian Shanell 1 Valley Road, Scarborough, N Yorkshire

Perseus and Andromeda on CBM 64. Could you tell me how to get the helmet from the statue in the cave? K Bentley, 101 Church Road, Birkenhead Merseyside

Mission Impossible on Vic 20 How do you defuse the bomb? What is the water for? M Brennall, 32 Begonia Avenue Farnworth, Bolton, Lancs BL4 0DS

Williamsburg Adventure 5 on C 16. How to become Student? How do I get into the Music Teachers Shop? How to kill Student? Darren Edwards 26 Central Avenue, Chadsmoor Cannock, Staffs.

Journey to Revelstone on Spectrum. How do I get through the two gates? The guard always kills me E Findlay 9 Edmiston Avenue Prestwick Scotland

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Empire of Khan on CBM 64. I can't get the diamond from the snake How do I get the key from the Witch? P J Fox 94 SU RAF BFPO 23

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System 15000 on Commodore 64. The Auto/ID to enquiry code for 'Scuba International Security Co A Copson, 322 Burton Road, West Didsbury

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Castle of Terror on CBM 64. How do you open the bookcase? What use is the sword and the spear? Chris Waite 16 Sussex Close Boreham, Nr Chelmsford, Essex CM3 3ED

Eye of Bain on Spectrum. How do you get the sword? How do you pass the black shape? Paul Wood, 40 Ash Tree Road, Oadby Leicester

Snowball on Amstrad How do I get buttons? What is the welder for? Can offer help on Jewels of Babylon and Forrest at World's End if you send an SAE. Andrew Walton Finlow Hill Cottage Over Alderley Macclesfield, Cheshire SK10 4UG

Time Traveller on Commodore 64 How do I make a time journey? Matthew Armstrong 241 Rose Lane Chadwell Heath, Essex

Ground Zero on Spectrum. How do I get the loaf and the second week's rations? Where is the battery? Adrian Bold, 19 Towersey Drive Thame Oxon

Aural Quest on Spectrum. How do you get to New York? Paul Wood, 40 Ash Tree Road, Oadby Leicester

Tir Na Nog on Commodore 64. How do you get the objects from the creatures to the caves and huts without them? Stewart Waide 31 Lotus Rise Catterick, N Yorks (Tel Richmond 833269)

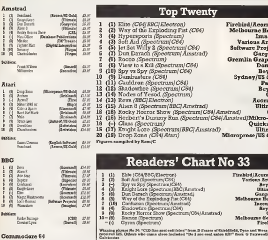
Hulk on Commodore 64. How do I kill the ants? I have got 16 gems including the bio-gem Matteo Vaccari V Sudorno 23 Bergamo Italy

Jewels of Babylon on Amstrad How do I pass the crocodile and the boa and how do I get to and pass the cannibals? Hervie Sean 156 Latchmere Drive Moor Grange Leeds 16

Upper Gumtree on Commodore 64. How do you get past the sharks? What use is the hacksaw and the bike? Christopher Wood 16 Sussex Close, Boreham, Chelmsford, Essex

Return to Eden on BBC How do get down from the tree that has the fragile branch? C Murray, 8 Sarum Bracknell Berks

Charts



Amstrad

1	(3)	Beachead	(Access/US Gold)	£9.95
2	(1)	Knight Lore	(Ultimate)	£9.95
3	(5)	Dun Darach	(Gargoyle)	£9.95
4	(2)	Alien 8	(Ultimate)	£9.95
5	(4)	Rocky Horror Show	(CRL)	£8.95
6	(–)	Mini Office	(Database Publications)	£5.95
7	(6)	Minder	(DK'Tronics)	£9.95
8	(9)	Fighter Pilot	(Digital Integration)	£8.95
9	(10)	Sorcery	(Virgin)	£8.95
10	(8)	Chetteblaster	(Virgin)	£9.95

Bubblers:

Frank 'N' Stein	(Amsoft)	£8.95
Millionaire	(Incentive)	£9.95

Atari

1	(5)	Drop Zone	(Microprose/US Gold)	£9.95
2	(1)	Archon	(Ariolasoft)	£11.95
3	(–)	Airwolf	(Elite)	£7.95
4	(3)	Miner 2049 er	(Big 5)	£9.95
5	(4)	Colour Space	(Llamasoft)	£7.95
6	(–)	Hard Hat Mack	(Ariolasoft)	£9.95
7	(7)	Mule	(Ariolasoft)	£14.95
8	(9)	Bruce Lee	(Datasoft/US Gold)	£7.95
9	(9)	Decathlon	(Activision)	£9.95
10	(6)	Ghostbusters	(Activision)	£14.95

Bubblers:

Kissin Cousins	(English Software)	£8.95
Beachead	(Access/US Gold)	£14.95

BBC

1	(1)	Revs	(Acornsoft)	£14.95
2	(2)	Alien 8	(Ultimate)	£9.95
3	(3)	Atic Atac	(Ultimate)	£7.95
4	(4)	Repton	(Superior)	£9.95
5	(6)	Confuzion	(Incentive)	£6.95
6	(6)	Knight Lore	(Ultimate)	£9.95
7	(–)	Elite	(Acornsoft)	£12.95
8	(7)	Magic Mushrooms	(Acornsoft)	£12.95
9	(9)	Lode Runner	(Software Projects)	£9.95
10	(8)	Wizardore	(Imagine)	£7.95

Bubblers:

Birdie Barrage	(CDS)	£7.95
Combat Lynx	(Durell)	£9.95

Commodore 64

1	(1)	Way of the Exploding Fist	(Melbourne House)	£9.95
2	(2)	Elite	(Firebird/Acornsoft)	£14.95
3	(3)	Dambusters	(Sydney/US Gold)	£9.95
4	(4)	Shadowfire	(Beyond)	£9.95
5	(7)	Soft Aid	(Various Artists)	£4.95
6	(6)	Drop Zone	(Microprose/US Gold)	£9.95
7	(8)	Pitstop II	(Epyx/US Gold)	£9.95
8	(6)	View to a Kill	(Domark)	£10.99
9	(10)	International Tennis	(Commodore)	£5.95
10	(9)	Graham Gooch's Cricket	(Audiogenic)	£9.95

Bubblers:

Thing on a Spring	(Gremlin)	£7.95
Nick Faldo Plays the Open	(Mind Games)	£9.95

Spectrum

1	(1)	Hypersports	(Imagine)	£7.95
2	(3)	Rocco (Rocky)	(Gremlin Graphics)	£7.95
3	(8)	Jet Set Willy 2	(Software Projects)	£7.95
4	(5)	Spy vs Spy	(Beyond)	£9.95
5	(6)	Shadowfire	(Beyond)	£9.95
6	(4)	Soft Aid	(Various Artists)	£4.95
7	(9)	Nodes of Yesod	(Odin)	£9.95
8	(7)	Dun Darach	(Gargoyle Games)	£9.95
9	(–)	Glass	(Quicksilva)	£7.95
10	(9)	View to a Kill	(Domark)	£10.99

Bubblers:

Dynamite Dan	(Mirrorsoft)	£6.95
Monopoly	(Leisure Genius)	£9.95

All figures compiled by Ram/C

Top Twenty

1	(1)	Elite *(C64/BBC/Electron)*	Firebird/Acornsoft
2	(2)	Way of the Exploding Fist *(C64)*	Melbourne House
3	(4)	Hypersports *(Spectrum)*	Imagine
4	(3)	Soft Aid *(Spectrum/C64)*	Various Artists
5	(5)	Jet Set Willy 2 *(Spectrum/C64)*	Software Projects
6	(7)	Dun Darach *(Spectrum/Amstrad)*	Gargoyle
7	(8)	Rocco *(Spectrum)*	Gremlin Graphics
8	(6)	View to a Kill *(Spectrum/C64)*	Domark
9	(10)	Spy vs Spy *(Spectrum/C64)*	Beyond
10	(9)	Dambusters *(C64)*	Sydney/US Gold
11	(11)	Cauldron *(Spectrum/C64)*	Palace
12	(12)	Shadowfire *(Spectrum/C64)*	Beyond
13	(14)	Nodes of Yesod *(Spectrum)*	Odin
14	(13)	Revs *(BBC/Electron)*	Acornsoft
15	(15)	Alien 8 *(Spectrum/BBC/Amstrad)*	Ultimate
16	(18)	Rocky Horror Show *(Spectrum/C64/Amstrad)*	CRL
17	(16)	Herbert's Dummy Run *(Spectrum/C64/Amstrad)*	Mikro-Gen
18	(–)	Glass *(Spectrum)*	Quicksilva
19	(17)	Knight Lore *(Spectrum/BBC/Amstrad)*	Ultimate
20	(19)	Drop Zone *(C64/Atari)*	Microprose/US Gold

Figures compiled by Ram/C

Readers' Chart No 33

1	(1)	Elite (C64/BBC/Electron)	Firebird/Acornsoft
2	(2)	Soft Aid (Spectrum/C64)	Various Artists
3	(–)	Spy vs Spy (Spectrum/C64)	Beyond
4	(3)	Knight Lore (Spectrum/BBC/Amstrad)	Ultimate
5	(6)	Dun Darach (Spectrum/Amstrad)	Gargoyle
6	(5)	Way of the Exploding Fist (C64)	Melbourne House
7	(10)	Confuzion (Spectrum/Amstrad)	Incentive
8	(4)	Shadowfire (Spectrum/C64)	Beyond
9	(8)	Rocky Horror Show (Spectrum/C64/Amstrad)	CRL
10=	(6)	Starion (Spectrum)	Melbourne House
=	(-)	Gyron (Spectrum)	Firebird

Winning phrase No 34: "CID fine neat cell felon" from D Fraser of Shieldfield, Tyne and Wear, who receives £25. Others who came close included "Do I see coal union tiff?" from G Fairweather of Colchester.

Now voting on week 36 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP

Voting for Week 36 closes at 2pm on Wednesday July 31 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.

Name .... **My top 3: Voting Week 36**
Address .... 1.....................................
.... 2.....................................
.... 3.....................................
My phrase is: ....

New Releases

ZAP AGAIN

As part of its Sparklers budget priced software range, Creative Sparks has released *Merlin* for the Commodore 64 I've seen this program before somewhere at full price although I can't remember who put it out Certainly it looks fairly dated

Merlin is a one screen zap game with you as wizard killing everything that moves and collecting spells to drop in a traditional style witches cauldron. The baddies not only whizz all over the screen crashing into you, but drop anti-spell parachutes that neutralise all the spells you've collected, forcing you to start all over again

It's zap and zap again really, there's not a lot more to be said, standard sprites and OK sound effects – in short, an ideal budget game

Program *Merlin*
Price *£2 50*
Micro *Commodore 64*
Supplier *Thorn EMI*
Thomson House
296 Farnborough
Hampshire GU14
7NF

CURIOUS BEAST

Lands of Havoc is a multi screen collect and dodge game that has been quite well received on a number of micros It has also been released on then QL As a QL program it is one of the best five arcade games available for the machine – but then look at the competition.

The idea is that you move a curious man/beast sprite around a couple of thousand screens looking for various objects – each one giving a clue to the object that's required next. There are hordes of animals and monsters that materialise a couple of seconds after you enter each new screen (just like *Sabre Wulf*) The screen consists of pathways bordered by 'fences' of background illustration – castles gardens buildings (just like *Sabre Wulf*)

What the game does have, of course, is millions of screens Personally I haven't yet found it compulsive enough to make me really relish that fact but the (Ultimate style) fold-out booklet suggests that all sorts of exciting things await me I have my doubts, but the fact remains that *Lands of Havoc* is probably an essential purchase if you are a games starved QL player

Program *Lands of Havoc*
Price *£19 95*
Micro *QL*
Supplier *Microdeal*
41 Truro Road
St Austell
Cornwall PL25 5JE

FUEL STOP

The Great American Cross Country Road Race is another road racing game like *Pit Stop* and more particularly *Turbo* It has the basic design of all such games, triangular shape road representing perspective and odd objects scrutheg towards you on the road borders Your car is represented by a dashboard with controls at the bottom of the screen and other cars are rear views in sprites – the effect is reasonably good but nothing special.

The additional elements to whizzing along as fast as possible without crunching your car are a map of America from which you plan your journey, traffic cops who set speed traps and a strategic element where you must bear in mind types of terrain and the frequency of fuelling stops

The trimmings make for a slightly more strategic road race game than most and that may be important to you In essence though, there isn't anything particularly exciting or original here

Program *The Great American Cross-Country Race*
Price *£9 99*
Micro *Commodore 64*
Supplier *Activision*
15 Harley House
Marylebone Road
London NW1

INGENIOUS

Timeslip is possibly the best C16 game I've yet seen It's wonderfully ingenious – a sort of three tier *Scramble*, the top third of the screen involving you piloting a spaceship, the next being a rocket man and the third controlling a submarine

Each section is attempted individually – you have to dodge the obstacles and destroy evil Time orbs Each works as a fairly nifty *Scramble* variant. Graphics are good by current C16 standards, as are sound effects

The timeslip element derives from the fact that to complete the game all the zones must be in sequence – they get out of sequence if you get blasted more than a certain number of times and most be resequenced within a certain time limit

Wonderfully addictive, ingenious and a must for C16 arcade addicts everywhere.

Program *Timeslip*
Price *£7 95*
Micro *C16/plus 4*
Supplier *English Software Company*
1 North Parade
Parsonage
Gardens
Manchester
M60 1BX

STOPPING AT

There was a time, I am reliably informed, when men were men, bobby-socks were in, and the dream of every little boy was to become a train driver

Ah, the romance of the footplate, the rushing by of stations the freedom of the track, the bad pay, the lousy working conditions not the most promising idea for a high-tech computer simulation you must admit. Yet, striking a brave blow for originality, such a program has just been released by those old warhorses Hewson, in the shape of *Southern belle*

Written by Mike Male (author of Hewson's *Heathrow Air Traffic Control*) and train buff Bob Hillyer, this could be easily written off at first glance, as a quirky, but ludicrously over-complex, piece of software This is far from being the case

The instructions – and there are plenty of them – are well set out and clear The game options are also well thought out and numerous enough to allow novice or expert to enjoy the trip from Victoria to Brighton riding the King Athur class 4-6-0 loco

There is a choice of five control options (from 'stop and go' to 'Blower, Damper, Fire, and Injector') and seven trip options from auto demo through record breaking attempts to commuter stopping trains

At the end of the run, (if you get that far), you are given a percentage for Efficiancy, Timekeeping and Safety, plus an overall rating

Played in real-time (although you can speed it up), the line graphics are adequate and the instrument display well designed.

Make no mistake about it, this program has a persuasive charm that will soon have you hooked

Got to be a hit.

Program *Southern Belle*
Price *£7 95*
Micro *Spectrum 48K*
Supplier *Hewson Consultants*
56B Milton Trading Estate
Milton Abingdon
Oxon

New Releases

PRICED OUT

Cuthbert in Space is another one of Microdeal's QL games issued at the same time as *Lands of Havoc* That someone is doing games for the QL is something QL owners ought to be glad about – but this is a dreadful game that would barely make it as a budget program on the Spectrum On the QL it costs £14 95

Now I wonder about this pricing; certainly it isn't unusual for a QL program and I appreciate that there are duplication problems and thus Microdeal is catering for a smaller market than with Commodores, Spectrums and Amstrads, but I really think it's too much (microdrives are under £2 now, probably much less in bulk) and there isn't that much competition on the QL – so why £14 95? Probably simply because that's what can be got away with

Back to *Cuthbert* Collect the egg shaped things, dodge the simple sprites then collect the falling objects, and so on All one screen and graphics that make the Spectrum look good (well, better anyway) Despite the dearth of games software for the QL, this is not one for your collection

Program *Cuthbert in Space*
Price *£14 95*
Micro *QL*
Supplier *Microdeal*
41 Truro Road
St Austell
Cornwall PL25 5JE

TRADE OFF

Pegasus is an adventure from Herron Software It is a text adventure, not Quilled, not in machine code and it costs £6 50

That makes it well above the price of similar programs and as such it ought to have something unique to offer What it is, being *generous*, is a reasonably well designed goblin basher with trading and fighting elements

For Basic, response times were pretty good and the locations nicely descriptive Nasty creatures started leaping out at me almost from the beginning so you could also say it's fairly action packed as well.

The problem is simply that all this would be fine at a couple of pounds, but £6.50 is simply too much – there just isn't enough to the program. The other problem, common in Basic, is that it's rather easy to break into the problem – this could be infuriating if you did it accidentally at a late stage in the game.

If you're an absolute no holds barred adventure nut then this is a maybe, if not there are plenty of other, cheaper, choices around.

Program *Pegasus*
Price *£6 50*
Micro *Spectrum*
Supplier *Herron Software*
64 Cardigan Lane
Leeds LS4 2LD

Pick of the week

SOPHISTICATED

Vortex have been making addictive 3D games for a long time while now – worth pointing out because a lot of people are going to say that *Highway Encounter* looks an awful lot like an Ultimate game So it does, and there's no way the author of *Highway Encounter* hasn't seen *Knight Lore* Nevertheless it's a technically superb, thoroughly addictive game with plenty of original touches

To visualise *Highway Encounter* imagine a lateral *Knight Lore* – your view of the map stretching over several screens from bottom left to top right, rather like *Zaxxon* but with the screen scrolling on only when you reach the top right corner rather than continuously

Highway Encounter takes some of the Ultimate ideas of 'solid' 'usable' objects which can be shunted around to make a sophisticated strategic zap game rather than the judgement/timing challenge of *Knight Lore*

The idea is this, a team of five little robots called Vortons must push a litle 3D diamond shaped object over more than 30 screens One robot is under your control, the others follow each other along the centre line Each screen has different horrors and different possibilities for action Nasties include eye balls vicious venus flytraps, indestructible sparks and little space ships Some follow set patterns and can be blasted relatively easily – some of them come for you.

There are also a number of objects scattered around which may be used as a barricade or to block in the indestructible baddies Pushing or blasting them into the right position is a matter of some thought and planning – a nice

BALANCED

McGraw-Hill has committed itself to educational software for the Commodore 64 in a big way – the simultaneous release of 28 titles on a vari-

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Chop Suey	S	Atari	£8.95	English
The Galoen Maze	Ad	BBC B	£5 00	Vannin
Laser Attack	Arc	BBC B	£5 00	Vannin
Racecount	Ed	BBC B	£5 00	Vannin
Spider Speller	Ed	BBC B	£5 00	Vannin
The facts of Europe	Ed	BBC B	£5.00	Vannin
Double Turn	S	BBC B	£5.00	Vannin
Data base Utilities	Ut	BBC B	£12 00	Clares
The Great American	Arc	Commodore 64	£9 95	Activision
Desert Burner	Arc	Commodore 64	£9 95	Activision
Kayak	Arc	Commodore 64	£2.50	Creative Sparks
Algebraic Relations	Arc	Commodore 64	£2.50	McGraw Hill
Balloon Game	Ed	Commodore 64	£7 95	McGraw-Hill
Dictionary Use	Ed	Commodore 64	£7 95	McGraw-Hill
Division II	Ed	Commodore 64	£7 95	McGraw Hill
Fractions II	Ed	Commodore 64	£7 95	McGraw-Hill
Graphs II	Ed	Commodore 64	£7 95	McGraw-Hill
Hangman VI	Ed	Commodore 64	£7 95	McGraw-Hill
Hangman VI	Ed	Commodore 64	£7 95	McGraw Hill
Memory Trainer	Ed	Commodore 64	£7 95	McGraw Hill
Multiplication II	Ed	Commodore 64	£7 95	McGraw Hill
Place Value	Ed	Commodore 64	£7 95	McGraw-Hill
Problem Solving	Ed	Commodore 64	£7 95	McGraw Hill
Word Power	Ed	Commodore 64	£7 95	McGraw-Hill
Cartridge Doctor	Ut	QL	£21 95	Talent

ZAP

balance to the 'blast the baddies' element.

After some disastrous first tries I realised that blasted baddies stay blasted and trapped aliens stay trapped – for this reason the best technique is to block up your diamond shaped object and spare robots and then go ahead alone killing as much as possible and using objects to block in the baddies you can't kill. Then, theoretically, you can unblock your diamond and other robots and make one dash for it to the end.

My single worry about the game is that it may prove too easy. After grasping the above idea, I've got fairly close to clearing the way for a run through to the final zone – that's after around six plays. Still, it may still be a hell of a lot more difficult than I, smugly, think.

Program *Highway Encounter*
Price *£7 95*
Micro *Spectrum*
Supplier *Vortex*
Vortex House
24 Kansas Avenue
Langworthy Road
Salford M5 2GL

ety of subjects for ages three to 13. Many of the packages form a sequence growing in age range and sophistication, eg, *Multiplication I* is followed by *Multiplication II*.

Graphs II is a package aimed at 10-13 year olds and teaches how to read various kinds of graph and how to construct one from a set of data. It works by both presenting information and then asking questions about it.

Most important of all for this kind of package, it appears to be completely error trapped – I couldn't make it crash no matter how hard I tried. The pace of learning is obviously something that is difficult for a non-13 year old to judge, but I'd have said it was just the right balance of reiterating new information and introducing new ideas.

Certainly one of the best educational packages I've see – particularly welcome on the Commodore 64 which does particularly badly in the range and variety of the educational software available for it.

Program *Graphs II*
Price *£7 95*
Micro *Spectrum*
Supplier *McGraw-Hill*
Shoppenhangers Road
Maidenhead
Berkshire

ORIENTAL

Way of the Exploding Fist, Melbourne House's mega Karate simulation, has been responsible for, amongst other injuries, more sore throats (caused by the hysterical scream of Yeeehaaaarrrr aaarghhh at appropriate moments) than any other computer game.

Chop Suey from English Software is more oriental viciousness of the kicking and punching variety. This time it's Kung-Fu and it runs on the Atari machines with 48K or more.

The settings aren't as exotic as the gardens and temples of *Exploding Fist* but the graphics of the central fighters kicking each other's brains out seem nearly as good.

Good to see, also, that the program is home grown – ie, programmed in the UK. The current prices of the Atari machines make them absurdly good value and they deserve that kind of support.

Program *Chop Suey*
Price *£8 95*
Micro *Atari*
Supplier *English Software*
1 North Parade
Parsonage
Gardens
Manchester

ON THE WARD

St Crippens is a weird Spectrum game which forms part of the Sparklers series of budget games. Graphically this one is a bit disappointing, it's a rather dull looking (mostly two colour) affair with simple line graphics as background.

It gets a few Brownie points for wackiness of plot though. You have been admitted to St Crippens, the worst hospital in the world, and have to get out before something dreadful happens to you, like death for example. This involves running around lots of hospital orientated screens picking up useful objects like clothes whilst being chased by a collection of doctors, nurses and mutant thingies from the Genetic Engineering Lab.

The worst aspect of actually playing the game is the naff collision detection – it seems that you can be 'nabbed' from several yards away, which makes getting caught fairly arbitrary. Unless the vaguely amusing plot appeals to you, I wouldn't put this on your list of must buys.

Program *St Crippens*
Price *£2 50*
Micro *Spectrum*
Supplier *Creative Sparks*
296 Farnborough
Road
Farnborough
Hants

This Week

Pegasus	Ad	Spectrum	£6.50	Herron
Juggernaut	Arc	Spectrum	£9.95	CRL
Rockford's Riot	Arc	Spectrum	£9.95	Monolith
St Crippens	Arc	Spectrum	£2.50	Creative Sparks
Southern Belle	Sc	Spectrum	£7.95	Hewson
Games Aid	Ut	Spectrum	£4.90	Sigma Soft

Key **Ad** – adventure **S** – strategy-simulation
Arc – arcade **Ut** – Utility
Ed – education

Activision 15 harley House, Marylebone Road London NW1 01-486 7588 **CRL** CRL House 9 Kings Yard, Carpenter's Road, London E15 2HD 01-533 2918 **Clares** 98 Middlewich Road Rudheath, Northwich Cheshire CWQ9 7DA 0606 48511 **Creative Sparks**, Thompson House 296 Farnborough Rd Farnborough Hants, 0252 543333 **English** Box 43 Manchester M60 3AD, 061 835 1358 **Herren** 64 Cardigan lane Leeds LS4 2LD **Hewson,** 7 Graheme Close Blewbury Oxon OX11 9QE 0235 832939 **McGraw-Hill** Shoppenhangers Road Maidenhead, Berkshire SL6 2QL 0628 23432 **Monolith** 3rd Floor Lector Court 151 Farringdon Road London EC1R 3AD **Sigma Soft** 6 Pine Dale Rainford Merseyside WA11 8DP **Talent** Curran Building, 1091 St James Road Glasgow G4 0NS 041-552 2128 **Vannin** 133 Boroughbridge Road, York YO2 6AA

Questions, questions

What is a computer? How is the Intel 8086 chip like the radio programme *Twenty Questions*?

In *Twenty Questions* 20 questions are asked, to each of which the answer is (in theory) Yes or No. There are two alternatives, and so with 20 sets of two alternatives there are 2↑20 possible outcomes. 2↑20 is equal to 1048576, or (in computerese) 1M. The Intel 8086 chip has a 20-bit pointer to address locations, so that the address range is 2↑20, or 1048576, or (in computerese) 1M.

This is the answer to the second question: both *Twenty Questions* and the Intel 8086 can point to 1M different items. This is also the answer to the first question: a computer is a machine which acts by combining sets of two alternatives (when it operates digitally). A computer is a device for combining information.

If *S* is the number of different possible states, and we do not know beforehand which of the possible states is likely to occur, then the *information content* (*I*) of the states is given by

$I = Lg2(S)$

where Lg2 represents the logarithm to base two, and the units of information are sometimes known as Shannons (after Claud Shannon, one of the inventors of information theory). The information content of 1048576 different states is thus

$I = Lg2(1048576)$
$= 20$

The information content needed to describe 1M different states is thus 20 Shannon, or 20 questions, or a 20-bit pointer. The information content of 100 different states is thus Lg2(100) = 6.64 Shannon. This means that to discern the size of an integer between one and 100 will require seven questions of the nature "Is it higher than this value? Since one Shannon is equal to one bit, and as it is impossible to have 0.64 of a bit, in the case of establishing the correct number from 100 ordered alternatives, sometimes it is possible to get the correct answer in six attempts, more often it takes seven attempts. On average, assuming an optimal strategy and evenly distributed numbers, it takes 6.64 guesses. The Shannon is simply an average.

Information theory does not deal in absolutes, it deals in averages – in expectations – and the averages are bit information known as Shannons. The correspondence between bits and information content is quite powerful, because it enables us to realise that the information content of a byte is eight Shannons. The potential information content for an Intel 8086 is 20 + 8 = 28 Shannons (or Lg2(1048576 x 256)). That is, it is possible to distinguish between all the 1048576 x 256 different states of an Intel 8086 computer by asking 28 simple (Yes/No) questions.

I have noted above, computers are information manipulation devices, and the basic unit of information is one Shannon (or one bit for a digital machine). Computers are more flexible than any type of machine for this reason. In general, machines manipulate raw energy, and do not manipulate anything which might be termed 'information'. Many machines have a great flexibility in that they can be in many different states, but these states have little or no information content. For a set of states to have an information content, the transitions between the states must not be predetermined.

The reason why I have emphasised that one Shannon is effectively equivalent to one question is that the idea of questioning is something we can readily understand.

Computers are information manipulators, but we can exhaust the limits to the variation in their information by just a few simple questions. For how many human enterprises is this true?

Boris Allan

Building bricks

Puzzle No 167

I was watching my young nephew the other day building with his toy bricks. He was building piles of bricks of various sizes, but always either a single brick, or a larger pile comprising a complete cubical arrangement. At one point, I noticed that he had three piles of bricks, as shown.

1 5 3

There was a single brick, then next to it was a 5 × 5 × 5 arrangement, and finally a third pile with three bricks along each edge. Each pile was complete, and I calculated that in the three piles there was 153 of the individual bricks – a number that was curiously reflected in the numbers of bricks along each respective edge.

Assuming that he had unlimited supply of bricks, what is the next largest set of three cubical piles that has this unusual property?

Solution to Puzzle No 163

The shortest route is 238ft. 0" and the height above ground at which he should go round the back of the wall is 186. 0"

```
10 LET S=35.355
20 LET T=100+S
30 LET D=1E6
40 LET H=0
50 FOR N=1 TO (S*12)
60 LET X=SQR((N*N)+((100*12)*(100*12)))+SQR(((S+
   100)*12*(S+100)*12)+((S*12-N)*(S*12-N)))
70 IF X<D THEN LET D=X:H=N
80 NEXT N
90 PRINT "SHORTEST DISTANCE IS ";D/12;" FEET"
100 PRINT "AIMING FOR A POINT ";H;" INCHES FROM
   THE GROUND"
```

The height of the fly above ground level is easily found to be 35.355ft. (The side of a square having a diagonal of 50ft.) Consequently, the fly is 135.355ft from the edge of the wall.

Winner of Puzzle 163

The winner is T Markham of Frampton Cotterell, Bristol, who receives £10.

Rules

The closing date for Puzzle No 167 is August 21

The Hackers



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